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BRIEFLY TOLD.

PRESIDENT PRATT'S ADDRESS.—Again we have to say to those who read the JOURNAL, whether as members of the American Gas Light Association or not, that our failure this week to give a fair chapter or two in regular order, of the proceedings of the Boston meeting of the American Gas Light Association, is directly chargeable to the gentlemen who control its affairs. The Spartan steadfastness of the Council, in the instance of holding hard and fast to the rules that only a limited abstract of the discussions on the papers read may be printed, such abstract before printing to receive the unqualified seal of approval of the Secretary, is by us respected and regretted. Respected, because it is the law of the body; regretted because it serves no useful purpose, either for the Association's advancement or for the benefit of the industry at large. The last reigning President of the Association (Mr. Edward G. Pratt, President and Manager of the Capital City Gas Light Company, Des Moines, Iowa) may not think the foregoing introduction to a word or two over his address has much relevancy; but the bare fact is that our references thereto would be more to the point did we have the right to speak now from the record. However, even if we have not the matter that led to it and preceded it, both as to its reception and subsequent report from the committeemen who considered it, we print its text in full in this issue. It will not take on any added value through commendatory words of ours; but commendation is given to it in full and unreserved measure. It is a well thought out paper even though one might fairly say of it that it is a trifle politic; but of such is the current nature of man. Aside from the diplomacy of Mr. Pratt's writing in general, it is somewhat reassuring to know that there is not much doubt about his being a gas man, as witness his references to the relations that exist to-day in gas and electric trading; and his own Company is engaged in both divisions thereof. It is also to his credit that having shown himself decidedly in favor of modern practice in regard to increasing sales of gas by up-to-date shop methods, he does not overlook the important point that such methods are not altogether to the advantage in the present showing of the man who makes the gas. In support of that we quote these lines: "The holder cost multiplied by two was generally considered as a reasonable estimate of the cost at burner. It is evident that such method would not now be a safe one to depend upon, for while the cost of manufacture has been greatly reduced in recent years, the cost of distribution has been largely increased, due to more *liberal* methods employed to receive and hold business." In the early days the gas engineer did it all, and he had too much to do, with the result that the counter end suffered a trifle; but might the later day practice not go to the other extreme, through showing most of the liberality in the office and not much at the works? Without attempting to answer that proposition in the style of the off-hand progressivists, we do not think we will be antagonized over the general statement that without the works the office would be a lonesome place. President Pratt's address is a good one, and his fealty to the gas interests, which interests are known to him from the generating house to the Presiden't office, is only shown more emphatically by his address at the Boston meeting.

PROCEEDINGS OF THE NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.—We are indebted to Mr. N. W. Gifford, Secretary of the New England Association of Gas Engineers, for a copy of the proceedings of the meetings held in 1900 and 1901. To the pleasing pertinacity of Mr. Walter R. Addicks, of Boston, who presided over the 1900 and 1901 meetings of the Association, is mainly due the determination of the Association to collate and print the records of its 31 years of useful, fraternal work; but upon Secretary Gifford came the task of compiling and editing and all that these imply. The result is creditable to him and cannot fail to put into the quiz of Walter Addicks' eyes a glint denoting satisfaction. The book is from the press of the New Bedford Printing Company, and in

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point of type and binding nothing can be found wanting; the printing is flawless. It may seem, perhaps, ungracious to say it, yet it looks that the index might have been differently arranged with advantage. But indexing is a craft by itself, Mr. F. H. Shelton "to the contrary, notwithstanding." A most lifelike portrait of ex-President Walter R. Addicks is the frontispiece. The Association proposes to publish the proceedings of former years in their entirety.

NOTES.—Mr. Jas. Ferrier, the successful Manager and Superintendent of the Gas Light Company, of Columbus, Ga., is not as lonesome as he was, an inference seemingly accurate from the fact that before us is a handsomely engraved note sheet which bears these lines: "Mr. James Ferrier; Miss Annie Loflin. Married, Monday, October 14th, 1901. Montgomery, Ga." The best we can say in the premises is to wish for them a prosperous and happy partnership. Mr. and Mrs. Ferrier will be at home, after November 1st, in Columbus, Ga.——With exceeding regret we report the death of Mrs. Anna M. Bigelow, the estimable wife of Mr. A. F. Bigelow, Superintendent of the Allentown (Pa.) Gas Company' whose demise occurred the evening of the 11th inst. Mrs. Bigelow was in her 49th year, having been born in Swansea, N. H., February 8th, 1853.——The City Council of Batavia, Ills., has issued a franchise to the projectors of the Batavia Gas Light Company. The life of the same was put at 20 years. The people behind the project are Messrs. Ira C. Copley and his friends, who control the Aurora (Ills.) plant. No generating plant will be erected at Batavia, it having been arranged to obtain the supply from the Aurora works. Both places are on the Fox river, and only 7 miles apart. Batavia is quite a busy center, and its population cannot be much less than 5,000.——Manager Cline, of the Paris (Ky.) Gas Light Company, as an earnest of how he proposes to make his recent acquisition of that property more profitable to himself and of greater benefit to the residents, has given public notice that, from the 1st inst., these selling rates are to rule: For a supply on illuminating account, $1.60 per 1,000 cubic feet; for a supply on fuel account, $1.35 per 1,000. Prompt payment (10 days after bills are rendered) will entitle the user to a rebate of 10 cents per 1,000. The Company sells uncrushed coke at 9 cents per bushel, delivered; and the charge for crushed coke is 10 cents per bushel.

[Special Correspondence.]

The Visit to Concord and Lexington by the American Gas Light Association.

Concord and Lexington: A Twice-told Tale: April 19, 1775.—When the colonial wars established the early supremacy of England in America it became at once necessary to provide for the government and defense of this great land. The scheme for defense included quartering 10,000 British soldiers in the country, and in providing that the expense for their maintenance should be borne by the colonists. Massachusetts was in the forefront of the ranks that shared the expeditions against the French and Indians, but she refused, from the outset, to the imposition of the stamp taxes, the taxes on tea, etc., that Parliament now endeavored to levy. The repeal of the stamp act was followed by the circular letter of the Legislature of Massachusetts to the other colonial Legislatures urging united effort for the protection of their rights. This letter gave great offense to the King and to Parliament, and was followed by the refusal of Boston to find quarters for the British troops soon sent here for the defense of the Colony. The feeling against the soldiers resulted in the Boston massacre in 1770. Then came the Boston tea party and other evidences of the determined resistance of Massachusetts to all forms of injustice and oppression. In order to particularly punish Massachusetts, Parliament now passed the Intolerable Acts, among which were included the Boston Port Bill, which forbade all trade and commerce and shut the port against all ships, and other bills changing the form of government of the Colony, permitting persons to be seized and sent out of the Colony for trial, and quartering troops upon the people.

This intolerable tyranny resulted in action on the part of the colonial legislatures, and the first Continental Congress was held in Philadelphia, in 1774, when an address to the King was supplemented by a Declaration of Rights. Massachusetts had named the date and place of meeting of this Congress, and was prominent in its deliberations. The eyes of the country now turned to Massachusetts to see whether she would continue staunchly to resist the oppressive acts of Parliament. The enforcement of the Boston Port Bill had been assigned to General Gage, who arrived in Boston, in May, 1774, as Captain-General and Governor of the Province. He was received with respect, his gallantry in Braddock's campaign was well known, he had married in a New York family, his personal address was most pleasing. This initial popularity was not long proof against his narrow view of men and things about him. He regarded the mass of the people as a despicable rabble; he could not understand how devotion to principle could be permitted to interfere with material success and comfort. His instructions were to require a full and complete submission to the King's will, and in the performance of this harsh duty he proved unfit for his position as a civilian and as a soldier; he was insincere, arrogant and incapable. The Boston Port Bill went into operation on the 1st of June, 1774, amid tolling of bells, fasting and prayer, and every expression of mourning and sympathy. General Gage thought that the most presumptuous of the patriots had been staggered, and looked for general submission; but the excitement in the public mind was intense, the union of the colonies was promoted, supplies for the British troops was refused; and finally, despite the fact that the poor were thrown out of employment, and that distress was deep in general, the mechanics of Boston refused to work on the barracks designed for the additional troops that were now brought into Boston to uphold the authority of the King.

From the founding of the Province of Massachusetts Bay the invariable form of control of the settlements was through the town meetings. The selectmen were chosen to act as an executive body, but the general affairs of the town were decided in general meetings. Absentees from these local assemblies were fined; on the other hand, any man, inhabitant or foreigner, could make any motion or present any petition. Every question of finance, taxation, law, and human rights was discussed, and the hand votes of the citizens were equal. No man could devise, no ingenuity could suggest, a better school for instilling the fundamental principles of freedom and equality, with recognition of the *sine qua non* of republican government that the majority must govern. Every farmer, artisan, mechanic, laborer and every merchant knew that he was a unit in the grand total, claimed his rights and proclaimed his principles and duty. General Gage issued writs convening the General Court at Salem on October 5, 1774, but, alarmed at the angry state of the people, he fortified Boston Neck (the only land approach to the city) and countermanded the meeting. However, the members elected to the General Court by the town meetings resolved themselves into a Provincial Congress, and adjourned to Concord and then to Cambridge. This memorable Congress authorized the collection of military stores, and then the Committee of Safety authorized the purchase of materials for an army, and ordered them to be deposited at Concord and Worcester. General Gage denounced these proceedings as treasonable, but a second Provincial Congress went even further (February, 1775), and empowered the Committee of Safety to assemble the militia whenever it was required to resist the execution of the intolerable acts. The plan for organizing and maintaining the militia provided that one-fourth of the number enrolled should be ready to muster at the shortest notice, hence they were called minute men. It was becoming clear that force only could decide the contest. Stimulated and supported by public opinion, army supplies were collected and stored at Concord and Worcester; the towns voted money freely to arm, equip, and discipline "Alarm List Companies," in whose ranks could be found citizens of every calling. The public press was divided, several papers in Boston sustaining the loyalists, but others in Boston, and all news letters outside of Boston, gave great encouragement to the cause of the patriots.

In the meantime more troops arrived in Boston, now the only point in Massachusetts where the King's authority was persistently enforced. Gage asked for 20,000 men, although he was writing to Lord Dartmouth that the Americans were cowards who could be overawed by the look of British soldiers, and that 5 regiments would march from one end of the Continent to the other. The leading patriots were anxious to keep Boston free from the mob spirit, and they endeavored to live as peaceably as possible with the troops. This self-repression, this great self-control and restraint, concealed from General Gage the true aspect of affairs, and perceiving that so many of his plans had been thwarted he conceived that the proper course would be to disarm the colonists. In January, 1775, he sent a detachment of British troops to guard and protect a number of "Loyalists" at Marshfield; this further irritated and alarmed the patriot faction, or the "rebel faction" as he called them. Next February 26, 1775, Gage sent Colonel Leslie and his command to seize brass cannon at Salem; the force landed at Marblehead, but the people near at hand opposed the passage of the troops over the bridge to Salem and blood was shed by some bayonet pricks. The alarm was sounded, and the minute men assembled in time to see Colonel Leslie withdrawing his soldiers without accomplishing the purpose of the expedition. From now on the pacific policy of the patriots was severely tried by the bearing of the British troops, even the officers making many efforts to bring about a collision, in every way irritating and inflaming the people.

It was remored that General Gage intended to destroy the military stores at Concord, so a careful watch was established and couriers were engaged to alarm the country. Vigilant patriots soon detected British officers in disguise, sketching the roads and reconnoitering the towns, while occasionally bodies of troops marched into the country adjoining Boston. Early in April the Provincial Congress sent a circular letter to the Committees of Correspondence, urging that the militia and and minute men be ready for any exigency, but to be patient and forbearing, and to act only on the defensive. From the 14th to the 19th of April, the Committee of Safety prepared for immediate hostilities, established artillery trains, made cartridges, provided cannon, and distributed army supplies. These preparations could not be concealed, and the effect in Boston was to make the British troops more than ever insulting in their conduct; only a spark was needed to set aflame the new beacon of liberty. There were now 4,000 troops in Boston (the total population of the town was only 17,000) and against the advice of his military and civil councils, Gage resolved on a secret expedition to destroy the magazines at Concord. Patriots in Boston, ever watchful, observed that the boats of the transport ships were being launched and made ready for use, and that the grenadiers and light infantry had been relieved of guard duty. Timely warning was sent to Concord, and a part of the stores was removed to Groton. On the 18th April, a number of British officers were stationed on the roads leading out of Boston to prevent intelligence of the intended foray reaching the country, but these officers were encountered by the members of the local Committee of Safety, and Doctor Warren despatched Paul Revere and William Dawes, who informed John Hancock and Samuel Adams, whom they found sleeping in Lexington, at midnight that a large body of the King's troops had embarked in boats, landed in Cambridge and were on the way to Lexington. Lexington lies 12 miles northwest of Boston, and 6 miles southeast of Concord. The road from Boston divides near the center of the village, the left branch leading to Concord, the right to Bedford. On the south corner of the triangular green of Lexington Common stood the meeting house, facing directly down the road towards Boston. On the other side of the road, opposite the meeting house, was Buckman's tavern. About 1 o'clock in the morning of April 19th, 1775, the alarm men and militia of Lexington began to assemble on the common, and by the command of Captain Parker the muskets were loaded with powder and ball; 130 men had assembled when a messenger arrived with word that no troops were to be seen on the Boston road. The minute men then dispersed into adjacent houses, most of them going into Buckman's Tavern. Prescott, informed by Revere and Dawes of the landing of the troops, hastened to Concord to give the alarm.

Meanwhile the British regulars were marching towards Lexington. Under Lieut.-Colonel Smith 800 had embarked at 10 o'clock at night at the foot of Boston Common; they landed at a point in the present Cambridgeport, and waded through the water and over the marshes to the Charlestown and West Cambridge road. Although their march was a silent one, they had gone but a few miles when the sound of guns and bells showed that the country was alarmed despite the precautions of General Gage. Colonel Smith sent a messenger to Boston for re-enforcements, and the stupid blunders of the staff officers receiving this despatch are the reason for the failure of Lord Percy to reach the returning column until after it had been disastrously repulsed at Concord. Colonel Smith sent 300 men forward under Major Pitcairn, to secure the bridges at Concord. Warned of the approach of this force at half-past four in the morning, Captain Parker again sounded the alarm, and the company of minute men was formed north of the meeting house on Lexington Common. The British officers regarded the American drums as a challenge, so they halted their troops, primed and loaded, and advanced at the double-quick. Captain Parker had ordered his men not to fire unless fired upon; but the British troops rushed on, yelling and firing, and Major Pitcairn shouted, "Disperse, ye villians, ye rebels! Lay down your arms!" The militia did not disperse, but they began to return the fire of the regulars. When 8 of the militia had been killed and 10 wounded, the provincials retreated up the road towards Bradford, crossing a swamp to a rising ground north of the Common. The British troops formed on the Common, gave three huzzas and fired a volley in token of victory.

It was nearly two o'clock in the morning when Concord was aroused by the sounds of the church bell. Concord lies between two hills that command it entirely; a river ran through it with two bridges over it. The town was large, and, for the times, very prosperous, populous and alert. The road from Lexington enters Concord from the southeast along the side of a hill, which commences on the right of the road a mile from the village. The main branch of the Concord river flows sluggishly in a serpentine direction, on the west and north sides of the village. It was crossed by two bridges, the Old South Bridge and the Old North Bridge; the latter was on the road leading to the home of Colonel James Barrett, the commander of the Concord militia, at whose house many of the military supplies were hidden. The ringing of the church bell brought together the committee of safety, the military officers and the militia and minute men. The grapevine telegraph summoned the militia of the adjoining townships, and the minute men continued to arrive in great numbers as the day wore on. When the British troops were seen advancing, their arms glittering in the early sunshine, Colonel Barrett retired with the militia over the North Bridge to a commanding eminence a mile from the center of the town. The British troops marched into Concord in two divisions, one by the main road, the other by the hill to the north of it, from which the Americans had just retired. Captain Parsons, with 100 men, went to Colonel Barrett's house, crossing over the North Bridge in sight of the militia, and leaving at the bridge three companies, about 100 men, under Captain Laurie. Captain Laurie was a very young man, 18 or 20 years of age, who had bought his commission and enjoyed the seniority resulting from its early date. It was fortunate for the Americans that an inexperienced commander was thus detailed to guard the very important post at the North Bridge; it did not make their work less important, but it made it more decisive. When the British had been in Concord about two hours, destroying stores, firing buildings, etc., about 450 minute men had assembled under Colonel Barrett's orders on the hills near the North Bridge. These men were from Carlisle, Chelmsford, Westford, Littleton, Acton, Concord, Lincoln, Bedford and the other towns in the neighborhood. Major Buttrick was ordered to dislodge the troops from the North Bridge; he was told not to fire unless fired upon. With 300 minute men he advanced towards the bridge. Captain Laurie now withdrew his men across the bridge to the east side of the river, formed them in platoons of about 10 files front, and began to take up the planks of the bridge. Major Buttrick urged his men forward to prevent the destruction of the bridge, and when they were a few rods from the bridge the British opened fire. On seeing several of his men fall, Major Buttrick called "Fire! fellow soldiers; for God's sake, fire!" During a few minutes the provincials fired, killing one and wounding another of the British, who immediately retreated in great confusion towards the main body. The provincials pursued them over the Bridge. Military order was now broken, and while some of the minute men followed the British, taking the high ground along the road over which they were marching, others of the militia retired to the eminence near the North Bridge, taking with them those who had been killed or wounded in the engagement. It would have been easy for them to have intercepted Captain Parsons and his detachment, who now returned from Colonel Barrett's house, but they were allowed unmolested to recross the North Bridge and to join the main body of the British in the center of the town. Colonel Smith concentrated his force and spent two hours preparing for the return to Boston, leaving Concord about 12 o'clock. In the meantime hundreds of minute men were answering the alarm that was spreading far and wide over the country. Men who had fought with Wolfe at Quebec, and who had been at the siege of Louisburg, came together to attack the British on their return march. It seemed as though men had dropped from the clouds, so numerous were the provincials who crossed the pastures to Bedford road to intercept the British at Merriam's Corner. The battle now began in earnest, and as the British troops retreated, a severe fire was poured in upon them from every favorable position. In many places the woods lined both sides of the road and it was filled with the minute men. For three or four miles along these woody defiles the British suffered terribly. In Lincoln, Captain Parker's Lexington Company again appeared and did much service, joining with the men from Woburn and Sudbury in pursuing and attacking the British from behind such defenses as could be gained at trees and walls. As the British arrived near the Lexington meeting house they again suffered severely from the close pursuit and the sharp fire. They had many killed, and the wounded impeded the march of the main body, ammunition began to fail, and the men were so fatigued as to be almost unfitted for service. In the confusion and distress of the moment the troops began to run rather than march towards Boston. The detachment must have surrendered had not the re-enforcements (so long and so inexplicably delayed), under Lord Percy, met the harassed troops about 2 o'clock, a half mile from Lexington Common. They were so exhausted that they lay upon the ground, with their tongues hanging out, as do dogs after a chase. Lord Percy's artillery played upon the provincials from the high ground near Munroe's tavern, and for a short period there was a cessation of battle.

Lord Percy now had under his command about 1,800 brave and vet-

eran troops, but he preferred to continue the retreat. Then the provincials renewed their attack. In West Cambridge the skirmishing became sharp and bloody, and many innocent inhabitants, old men and women, suffered at the hands of the British. Many of the Danvers minute men were here killed and wounded. As the British took the road round Prospect Hill into Charlestown their situation was critical. They had little ammunition left, their cannon were no longer effectively served, their wounded seriously obstructed the march. The provincials hung closely on their rear, and a fresh force was advancing from Roxbury, Dorchester and Milton to join with Colonel Pickering's Essex militia, 700 strong, to cut off their retreat to Charlestown. At sunset, General Gage saw his worried troops, almost on the run, coming down the old Cambridge road to Charlestown Neck, anxious to get under the protection of the guns of the British ships-of-war. General Pigot had command in Charlestown, and, with fresh re-enforcements, guarded the return of the troops to their quarters. The losses were: American, 49 killed, 39 wounded, 5 missing; British, 76 killed, 174 wounded, 26 missing.

Such was the "*Battle of the Minute Men*," the outcome of years of deliberation, of months of steady preparation. They believed in their cause and they kept their powder dry. Hundreds of the muster rolls of the Revolution date from the Lexington alarm. In England the news was so astounding as to appear incredible. "Those," said Edward Everett, "who stood in the breach at the breaking of this day of blood at Lexington, those who joined in battle and died honorably facing the foe at Concord, those who so gallantly pursued the flying veterans, deserve the tribute of grateful admiration." Massachusetts has made the 19th of April a State holiday, and Governor Greenhalge gave to the observance the name of Patriots' Day.

Eighteenth October, 1901.—On just such a day, fair, cold and windy, as faced the British troops when they started over the same route, the members of the American Gas Light Association set out for Lexington, 225 strong, among whom were about 75 ladies. In special cars the party travelled through Cambridge and Arlington, noting on the way many tablets erected in commemmoration of incidents of Patriots' Day. With a change of cars at Arlington Heights, the journey was resumed and soon we reached Lexington. Here we were addressed on Lexington Common by Rev. Mr. Staples, Secretary of the Lexington Historical Society. Mr. Staples described the battle, pointed out the location of the troops, and explained the action of both sides to the combat. We then accompanied him to the house of Rev. Jonas Clarke, where Hancock and Adams lay asleep when Revere arrived with word of the coming of the British. This house is the property of the Lexington Historical Society, and is filled with many interesting and precious trophies. One can see the affidavit of Captain John Parker, who commanded the Lexington Minute Men, an autograph letter of Lord Percy, pictures of Hancock and Adams, and of Dorothy Quincy, who afterwards married John Hancock, and who was a guest in the house on the eve of April 19th, 1775. But I observed that the articles that received the most attention from the ladies on this expedition were not the historical documents, nor the old furniture, nor the china, pewter, silver or gold, but their absorbed attention was given to the fine clothes that were displayed in the old cabinets, and to the decorated slippers, the dainty head-dresses and pretty pelisses. After listening to the brief talk that Mr. Staples gave at the old Hancock House, and receiving handsome guide books filled with fine photographs, the party registered in the Record Book of the Society (12,000 persons have registered in the last 6 months), then returned towards the Common, and in a convenient hall we were served with a fine luncheon. The cold air, the long ride, and the pleasant day had set up appetites that would not have found fault with plain food, but we the more enjoyed the hot dishes and the fresh coffee and chocolate that were abundantly provided. After this, there was still time to look about the town, to note the houses yet standing that were occupied on the day of the memorable fight, and to read the inscriptions that have everywhere been placed upon buildings of historic worth. The old tavern, not so hospitable as a hundred years ago, is none the less interesting, and the fine statue, by Kitson, of Capt. John Parker, shared the admiration with the great boulder set at the exact spot where his men stood when the first fire of the British was received.

Again embarked on the trolley cars, it was not long before Bedford was reached, and the fine farms, the fertile lands, the wooded hills, must have looked much the same as when the British marched through the country. But *they* had not wish nor leisure to view the landscape, and indeed I think they had time for no thought after leaving Concord unless a mere wink of the mind towards the ships and the forces in Boston. Soon we were passing Sleepy Hollow Cemetery, and entering Concord. Here we were told off into barges, and taken past the old Wright Tavern, down the Boston road, the very one over which the retreat of the British took place, past the Concord Antiquarian Society, the School of Philosophy and the Alcott home, to Wayside, the home of the Hawthornes. Our guide pointed out the stem of the original parent vine of the Concord grapes, where Mr. Bull once lived. Retracing our steps, we stopped a few minutes to examine the collection of the Antiquarian Society, especially opened to our inspection through the courtesy of the Secretary, Mr. Tolman. This is a precious and choice collection, gathered from the vicinity entirely, and includes the musket of the British soldier who was killed at the North Bridge, the sword carried by Colonel Barrett who commanded in the Concord fight, the tobacco box of Major Buttrick, who gave the first order to fire upon the King's soldiers, medallion portraits of King George and Queen Charlotte, carried by Lieut. Potter, who died a prisoner at Concord, etc. All these relics are fully authenticated. Here are the desk, chair and inkstand of Hawthorne, used when he wrote "Mosses from an Old Manse." The collection of old china, pewter, candlesticks, kitchen utensils, and articles of ornament is intensely interesting, and again I observed that the ladies were prone to scrutinize the articles of wearing apparel much more closely than the timeworn documents and the rusty flint-locks. Leaving here, we passed the site of the church where the Provincial Congress met, passed Emerson's house, and so on into Monument street, and over the Old North Bridge to the battle ground. The statue of the minute man, by French, commands the complete admiration of everyone, and as we drive round the turn to go back over the bridge, it is easy to people the nearby hill with militia, to see the red coats moving down the road, and to view the wounded British lying where their graves are now marked. Everywhere one can see tablets that give full and concise information, so that the progress of the fight and route of the forces can be traced by a careful study of these monuments. Returning to the town, we were driven down Main street, and shown the fine old mansions, the houses of the people who are, in many cases, descendants of the men who stood in the front ranks at Concord 126 years ago. The Concord river lies just as peaceful in the still meadows, the same sheen on its slowly running waters; the same trees shade its banks and cover the hills from which the militia rallied. Many of our party of visitors can trace descent from an ancestor who participated in the great day's work; after our visit there will be few who have not the most lively interest in claiming all that can come from such an inheritance. The town has great regard to its own historic value. No liquor is sold in its boundaries, no license is issued to any seeking to turn to profit the thousands of visitors. Concord and Lexington are not now unlike what they were in 1775; farming communities, quiet, thriving, self-respecting, free from pride except in doing right, in thinking highly and in living simply. They are now shrines to which true Americans, filled with love of country and of that country's glorious history, delight to make pilgrimages of respect and affection, to the end that the labors of those first in the vineyard, who bore the heat of the day, may never be neglected nor forgotton.—Mc.

Address of the President (Mr. Edward G. Pratt, Des Moines, Ia.) of the American Gas Light Association, on the Occasion of Its 29th Annual Meeting, Boston, Mass., October 16 to 18.

Gentlemen of the Association: Another year has passed into history, and we find ourselves gathered, for the 29th Annual Meeting of this Association, in the city of this country from which those of us who were so fortunate as to have lived at some time within its influence, believe it is from here all knowledge is supposed to emanate. Therefore, it is eminently fitting and proper that, standing in the doorway of the 20th Century, we should convene here with the assurance that this meeting shall be at least the equal of any that have gone before; and, viewed from the standpoint of history, patriotism and enthusiasm, a meeting in such a city and under such circumstances can be nothing short of success.

At the beginning of our proceedings I deem it my duty to speak a word in memory of our late President of the United States, William McKinley, whose cruel death we all mourn. It is especially fitting that a halt be made in the proceedings of this organization of business men while we lay tribute on the grave of a man who seems to us as nearly perfect in his private and public life as mere mortals can be. He had been a patriot from his youth up, serving his country in war in early manhood. He learned to love his country in the years of his country's distress, and the patriotism thus grounded and rooted was such as caused him to be constantly mindful of the republic's welfare. When the war

threatened he was determined not to have war until all efforts toward peace had been tried and found wanting, and then when war came he pursued it with the vigor which alone characterizes the race of people born to independence, self-reliance and courage. The country mourns McKinley; the world mourns McKinley; and this Association, representing such great interests, will certainly pardon this brief reference to a man whose life has been given for his country and who had been singularly free from the common frailties of men. It is especially proper at this, our meeting in Boston, the "Cradle of Liberty," that we all pay tribute to a man who loved liberty and who died exemplifying the freedom and equality of all American people.

It has been the custom of my predecessors, I believe, to briefly review what has transpired during the year, what successes have been attained, and to declare for the future, so far as present indications may suggest.

In retrospect, therefore, what has been accomplished during the year that is worthy of mention here? It is certain that we are working along conservative lines and that progress is being constantly made, but nothing startling has been developed or accomplished. In manufacture we believe that money is saved here and there only where attention is given to details. In truth, the difference between good and ordinary results may be gauged by either indifferent or close attention to minute details; and it goes without saying that the superintendent or manager of a works must have the education, inclination and disposition on his own part, backed by the assistance, appreciation and liberality of his superiors, and the interest and co-operation of his subordinates and those in his employ, in order that he may bring such a happy condition as will enable him to analyze his work from day to day, and to discover here and there where these details to which I make reference can be improved upon.

At this time we hear much about drawing and charging machinery, and inclined retorts for the large coal gas works of this and other countries, and I doubt not that for such works this sort of machinery and construction will be adopted where not now in use; but who will say that for the average sized gas works of this country either would be applicable from the standpoint of economy? I do not wish to be understood as saying that such appliances and construction are not practicable, even for small works; but up to the present time, so far as I have information, neither, for obvious reasons, I believe would be profitable.

There is opportunity for the average sized works to develop or improve its mechanical devices for the more economical handling of coal and purifying material, and where the preparation of coke for the trade may be reduced to the minimum. I do not mean to convey the idea but that this is being done at many works, possibly at more than I have knowledge of, and yet with what I have seen there is chance for improvement along these lines.

During the past 3 years there has been a decided advance in the price of oil for gas making purposes, which advance, and the fact that coal prices were down in 1899 and 1900, caused many gas managers to either revive their old coal gas benches or to build new ones. These changes, where changes have been made, were, during this period, of practical advantage, especially in localities where the standards of candle power required were not so high as to make the exclusive manufacture of coal gas prohibitive. And yet during this period of high priced oil and low priced coal I have it upon good authority that the number of water gas machines and their aggregate capacities have been increased each year during the past 3 years. This may be due, either to the great energy displayed by manufacturers of water gas apparatus, or to the comparative cheapness of such apparatus over modern coal gas installations, or to conditions depending upon locality, but presumably because it has become a well defined policy by the gas companies of this country that, in cities of 30,000 people and upwards, the interests of their patrons would at all times be better served by having both types of apparatus at their command.

Concerning the price of oil, it is undoubtedly true that the tendency to advance prices has received a check by the recent discoveries of oil in Texas. Whether this oil will be economical for us to use will depend upon price and the results of trial, to be determined by experiments and experience. Elaborate experiments in the use of Texas oil have been made at the works under my management during the past summer, but the conclusions reached, as a result of these experiments, and in comparison with other oils, I am not prepared to make; for enough information is contained therein to furnish material for an instructive paper. Certain it is that the discovery of oil in Texas has had a stimulating effect in the erection of new water gas apparatus. The estimated daily output of the Beaumont, Tex., oil field is 700,000 barrels, although doubt exists in the minds of those who are in position to know as to the correctness of the statement; but, comparing the estimated daily output of the other oil fields outside the Beaumont district (160,000 barrels), and making a liberal allowance for the former estimate, we cannot but conclude that any further advance in present rates for oil is, to say the least, remote. The permanence of the so-called Beaumont "gushers" cannot be predicted, but the discovery of oil there will undoubtedly stimulate a large amount of prospecting all over Texas, and the belief is that other paying "strikes" will be made in the near future.

There appears to be no diminution in the quantity of good gas coals in sight, and as the price of this product is regulated almost entirely by rates for transportation, the price at the mines remaining almost constant, it would seem, in view of the circumstances, that railroad companies may and undoubtedly will make rates that will enable those of us remote from water transportation to still seriously consider whether it shall be coal gas, water gas, or both.

The item of purification is now such a small one as compared with former years, that while new schemes have been advanced in the number, arrangement and construction of boxes employed, the notion prevails that, with 4 boxes of ample size, a good quality of oxide, and convenient means for handling it quickly, we would hesitate a long time before adopting anything different.

The market for residual products continues good, and especially that for coke. The demand for the latter is, of course, in a large degree due to locality and controlled by the price of anthracite and bituminous coal in that locality; but there is very much in educating people to an intelligent and economical use of coke in whatever sort of appliance it is to be used. I wish to emphasize the word education as used in this sense, for I know from experience that much can be accomplished in this direction. I presume there is more ignorance displayed by the average individual in the operation of any heating device requiring fuel, and especially in the economical use of coke, than in almost anything else.

Upon the important question of storage we find that, even though ample holder capacity is an excellent precaution, we can run much closer to any demands made upon our works than formerly; and this condition has been brought about principally by the introduction of water gas apparatus. It might also be truthfully said that the successful distribution of gas under high pressure eliminates in a large degree the necessity of having holder capacity so much in excess of daily needs as was formerly thought necessary.

There is a disposition among present day writers, supplemented by the opinions of men advanced in the business, to substitute another standard for the one so long in use, and the one we have held so much in reverence, to wit, candle power, and to substitute therefor heating value or the heat unit. And with this disposition comes the suggestion of a lower illuminating power; and why not, since the tendency is almost universal toward the use of the Welsbach or some other type of incandescent gas burner? Why, unless compelled by some legislative act, is it necessary for us to distribute to our consumers a gas of, say, 20, 22, 24, or even higher illuminating value, when, with a gas of, say, 14, 16, or 18-candle power and the use of the Welsbach or a similar type of burner, there can be obtained nearly equal results for our consumers, and certainly increased benefits to ourselves? We may not at once agree with Prof. Macadam, who, in a lecture[1] before the North British Association of Gas Managers, says, referring to the Welsbach burner: "The light is not obtained from the constituents of the gas, except indirectly from the heat of combustion. A perfectly non-luminous gas, or a very low candle power gas, provided it in burning gives a sufficient amount of heat, should furnish just as good a light result as a high quality gas;" and yet the statement is undoubtedly true. If, therefore, as seems to be a fact, the tendency is for a new standard, it behooves us to keep in mind any legislation bearing upon this question, or for those of us anticipating in the near future a renewal of franchises or the seeking of new ones, to see to it that the standard agreed upon, whether it be a lighting or heating value, is such as will enable our enjoying the benefits which seem now to be in the air, and which though to some may seem a step backward, yet in the "march of progress" are destined to be upon us before possibly we are prepared for them. There is much that may be said in favor of such a new standard as has been referred to, and a lower candle power, but both have already received the attention of eminent writers, and enough remains to furnish material for a paper by some member of the Association who has given the subject more thought and study than that indicated by the brief allusion I have herewith made to it.

The past year has been a notable one for extensive improvements and repairs, both at works and to our distributing systems. This is explained by reason of great reductions in the prices of all materials entering into the construction of new work; also, because all work that

1. See JOURNAL, Aug. 19, 1901, p. 291.

could possibly be postponed last year and the year before was held up on account of these high prices; also, because the constant growth of our business has made it imperative that we be prepared to meet the increasing demands. Our distributing systems have been extended, either for new business into new territory, or augmented so as to render better service in that territory already covered. In many of the cities and larger towns represented here I believe both have been necessary; for there seems to be no limit to the demand for gas in our respective communities.

Naturally, we inquire as to the cause of this increased popularity in the use of gas, and we are compelled to answer that it is because of the neglected education of our consumers already secured and prospective; for we have only recently awakened to the fact that our business has not been conducted along the same progressive lines as has other manufacturing industries. It has only been during comparatively recent years that we have exerted ourselves to find a market for our product.

Heretofore we have devoted most of our time and energies toward securing economical results at our works by saving here and there a few cents, or possibly fractions of cents, in the cost of gas in the holder, believing that when this was done, coupled with some attention to leakage, we had performed our duty faithfully and well. Many of us are familiar with the methods employed formerly in computing the cost of our gas. The holder cost multiplied by two was generally considered as a reasonable estimate of the cost at burner. It is evident that such method would not now be a safe one to depend upon, for while the cost of manufacture has been greatly reduced in recent years, the cost of distribution has been largely increased, due to more liberal methods employed to secure and hold business; for we are ever on the alert for new schemes and ideas that will enable us to increase the sale of our product. Witness our efforts in this direction. We have offices that are a credit to any community, equipped with attractive furnishings and fixtures. We display gas consuming devices of all sorts, kind, and description, in a manner that is the envy of the retail merchant, and we employ competent salesmen and saleswomen, who are peculiarly and particularly adapted, not only to sell these devices but to give instruction in their use. We advertise our wares and their use in daily papers and magazines, on bill boards, theater programmes, and in every other way that we believe to be judicious methods of advertising. We seemingly do everything to keep the use of gas before the people. We keep solicitors in the field the year around, and can tell at any moment, from the reports of these solicitors, who upon a certain street do not use gas and why they are not using it. Encouraged by the knowledge that our product has passed beyond the stage of luxury to that of necessity, and coupled with the fact that the majority of us are selling at a rate that will enable everybody to use gas, which rate has either been established by ourselves as good business policy, or through compulsion brought about by local conditions, is it any wonder that the limit of our business and the territory to be covered seems just as far off now as it did several years ago? The wealthy and the well-to-do classes in our respective communities are now supplied, except such as may locate and build later on. Our business now, therefore, is to educate and supply those possessed of less of this world's treasure, and I doubt not but I express the opinion of most of you when I say that this is desirable business, and the kind that is worth looking after, because this class of people are masters and mistresses of their own households, use only what they can afford to pay for, and pay for what they have—and usually without complaint. In saying this much upon the question of selling gas, I realize that I am trespassing upon a paper that will presently be presented by a gentleman who knows all about the subject assigned him, but I cannot refrain since it suggests other thoughts.

It is pleasing to contemplate that, by the efforts put forth to introduce gas engines, stoves, ranges, water heaters, etc., we have brought our day consumption up to a point where in many instances it far exceeds the night consumption ; and yet we must not forget that we are in the lighting business as well, and that no opportunity should be lost, either to hold old consumers or to secure new ones. We have had competition in the past with electricity that was disastrous to the companies furnishing it because it was illegitimate, due to the then prevalent custom of selling current by contract, and, therefore, with no very clear conception of the cost of supplying the consumer. I believe I am safe in saying that there has been a marked change in such methods, and that now it is the exception rather than the rule where electric current is sold by contract. Electric companies have fouud out that, for their own protection and and as a business proposition, the only way their business can be conducted is by the use of the meter. Hence, competition with electricity for light becomes a legitimate one, and under the circumstances our judgment is that gas companies have nothing at present to fear.

We must not forget that we are in the business of furnishing light as well as fuel and power. That electric companies are upon a firmer basis than in the past cannot be disputed ; and it is gratifying that it is so. They have also made rapid strides in the economy of operating, due to the general adoption of slow speed condensing engines coupled direct to the dynamo, and by the installation of larger units ; also, the development of the polyphase alternating system, and the introduction of the inclosed arc lamp, particularly for street lighting. As a result, the electric plant of to-day can be designed on lines of greater simplicity as to system, and can attain far greater economy in operating.

The disposition to consolidate gas and electric properties in smaller towns and cities is, I believe, good business policy, inasmuch as the tendency to cut rates for either gas or electricity below what is profitable is avoided, as under united management reasonable rates for either that will be profitable can be made and maintained.

It is in the field of light and power principally that we meet our electric competitors, if such they can now be called ; for we are disposed to believe that, as the years pass, the lines are not so tightly drawn. Each has its sphere of usefulness, and both are making more rapid progress in the development of their respective business, and in the service given than if either were in full possession. The situation is an extremely interesting one, and we look forward to the future with a full realization that it will be necessary for us to understand and to take advantage of our opportunities.

Through the instrumentality of the Welsbach and other incandescent gas burners we are able, by giving a superior light and a cheaper one, to more than hold our own, provided we give to the incandescent gas burner such attention as it requires to render efficient and satisfactory service. And in this connection it is well to emphasize, what probably most of us have found out, that it pays to inspect the burners and mantles and to undertake to keep out of the field anything and everything but the best. There is opportunity here also for the education of our consumers. If we could but establish their confidence to that extent that they would rely upon our statements as to the efficiency of certain burners as compared with certain others, and not be "bun coed" by traveling dealers, whose only object is to sell their burners without care as to the results which may follow, we would have achieved much in the right direction. This I believe will be accomplished in time, but it will require everlasting diligence on our part; and it means that we must keep the right sort of men in the field all the time to assist in doing it.

If in competition with the electric light we can give more light for less money, it behooves us to look to the comparative convenience of gas; for we admit that, for convenience in lighting and extinguishing, and for certain decorative purposes, the electric light is superior to gas light. But cannot the difference of convenience be reduced by the installation of electric gas lighting devices? These have been introduced in the larger cities, more especially in the East, and in reality are no new thing; but in the smaller cities and towns, especially in the West, I doubt if they have received the attention to which they are entitled. I believe it would pay any well regulated company to have in its employ a man competent to furnish estimates and perform this class of work in conjunction with the house piping and fixture business.

Gas lighting by means of chain by-passes is convenient but not absolutely satisfactory, especially where used in conjunction with the Welsbach burner. So-called self-lighters were on the market, but these must and undoubtedly will be improved upon before they can be generally used with satisfaction. The introduction of all such devices should be encouraged, and not too quickly condemned, for be it remembered that the Welsbach burner would have been short-lived if its early existence had depended upon the approval of its patrons or the enthusiasm of ourselves. Its success was due to the energy and persistence of those who had faith in the future of the burner, and to them our thanks are emphatically due that we are to-day able to perform so large a percentage of the lighting business.

It is pleasing to note that we are making progress in the introduction of gas engines, and while still handicapped on account of the first cost of installation as compared with the electric motor, yet we are able, by reason of the smaller cost of operating per unit of power furnished, to place an occasional engine, and this occasional engine means the addition of others. To make satisfactory progress in this respect my advice would be to first select the best engine we have any knowledge of (not the cheapest), and beware of the engine that may be converted quickly from a gasoline to a gas engine, or *vice versa*, for they are not to be depended upon for economy. Select from your force a man, if you

have one, competent not only to talk gas engine but who is also thoroughly posted in its operation: one who is able to figure the relative cost of operating with steam, electricity or gasoline. Each engine installed should be inspected at intervals so as to discover any defects (if any exist) and to remedy them. In my experience the average user of a gas engine has little regard for the cleanliness of the machine or the surroundings. In his judgment, it is necessary only to give it oil (any kind will do), to turn on the gas and let it go until he is ready to stop it, and the same method of operation is pursued day after day. It would seem, therefore, that our business from the time our product leaves the holder until registered on the meter dial is one of education, education that means an expenditure of money, thought, and energy, but which in the light of present and anticipated results will pay.

Referring briefly to the question of gas for street lighting, which for a number of years seems to have been relegated to the rear rank, in the march of progress is now, we are happy to note, gradually working itself to the front again.

The public, always in a receptive mood for the newest and latest things out, saw in the electric arc lamp a light that would convert darkness into daylight, hence, cities and towns made haste to adopt this new method of lighting and generally without regard to cost. It has had its trial and served its purpose, to the extent even of displacing in many towns and cities all the gas lamps originally in use; but it has been discovered that too much light in some places and none in others, and especially in the resident portion of cities is not satisfactory; that the more even distribution of light by the gas lamp, and beneath the foliage, is preferable. And it has been discovered that where gas is employed that the bugs and insects, and "every creature which is on the earth and under the earth, and such as are in the sea," do not reach that size and magnitude, and are not so numerous, that they fall down in heaps to be carried away by the scavenger the next day.

We admit that every arc lamp placed in the business portion of the city is equal to a policeman, and we are unmindful if companies furnishing them do receive as much compensation therefor as the average policeman receives; but in the light of the present day we are not willing to admit that, for residence street lighting, the electric arc lamp as usually placed is the equal of good gas lamps placed at intervals of say from 100 to 150 feet apart, having flat flame burners and consuming at the rate of 6 feet of gas per hour, said lamps to be of an attractive design, kept clean and in good repair. And this leads me to suggest that we are by no means dependent upon the flat flame burner for street lighting; for the incandescent gas burners inclosed in lanterns especially adapted for their use have made, through the energy of those introducing them, and because of real merit, very satisfactory progress. And I have it upon good authority that these have been placed in many of the larger cities of the country to the total number of 100,000, and with prospects for their continued rapid increase. I am sure that the satisfactory results given by these lamps may be attributed to the care and attention they receive, and it is evident from the number placed that they are giving satisfaction in communities where they have been installed. These lamps are placed at an average distance of 150 feet apart, the price depending upon the price of gas in that city or town. Those of you who have seen a street lighted with Welsbach lamps know how favorable the comparison is to the street where electric arc lamps are used, especially if employed in a residence section.

Concerning acetylene lighting, I understand that the manufacture of carbide at Niagara Falls and the Sault Ste. Marie is being made in large and increasing quantities, indicating that there is a demand for it somewhere. It is probable that this demand comes from towns too small for the profitable operation of a coal or water gas works, and there being many such, little doubt need exist but that this industry has a bright future.

I understand that the gradual and continued reduction in the price of carbide makes it possible for acetylene to be produced cheap enough to attract the attention of town councils for the lighting of streets and public buildings.

In passing it may not be out of place to mention that the question of electrolysis has received such vigorous attention in different parts of the country that street railway companies are giving prompt and careful attention to their construction work, both on new lines and by the repairing of old ones, so as to obviate or reduce to the minimum as far as present information will enable them any electrolytic damage to underground pipes conveying gas or water.

The question of the taxation of public franchises is one that always confronts us, and, like Banquo's ghost, "will not down," yet it is strange that it should be a never ceasing source of trouble and discussion.

A franchise is simply a privilege, a right, and is not property. The State grants the right or privilege, which is an intangible something, and surrounds it with all those limitations and conditions deemed necessary for the protection of the public. After this is done it immediately taxes, not alone all of the property belonging to the corporation holding the franchise, but taxes the very privilege it has just granted. The State in granting the franchise retains the right to control it and fix all charges in connection with it. The courts hold that the State retains the right to determine all charges and tolls, thus leaving the value of the franchise at the absolute mercy of every municipality, then, having done this, attempts to exercise the right of taxing if necessary this very public franchise out of existence.

In this way every corporation engaged in a public utility is subject to two methods of spoliation at the hands of municipal bodies. Does the treasury need money, the taxing body imposes a tax upon the franchise as it seems fit; do the people demand a reduction in the charge for gas, electricity or the like, the municipal authorities proceed to at once reduce the price to the consumer, so that the receipts are reduced at one end while the tax for the privilege to do business remains the same or is increased.

It is now conceded that the sovereignity retains the power to fix the charge for all public utilities at such reasonable figure as shall yield reasonable returns on the investment, not upon the investment with the value of a supposed franchise added. Yet while we are allowed to earn only a return on the actual value of the tangible property, we are taxed on the value of the franchise for which we are entitled to no consideration in fixing our earnings.

It is clear from this that a franchise is not and ought not to be a subject of taxation. The privilege granted to furnish gas is for the benefit of the general public as consumers, and the public should have the benefit in the fixing of a reasonable charge for the commodity, and the municipality should not have the benefit in the way of a tax.

Much has been said and written of late concerning profit sharing and building and loan associations, for the benefit of employees; also, methods and measures for the better care of workingmen employed in large manufacturing concerns in general, and in and about gas works in particular.

Many of us I presume have had a theory favorable to such a measure as "the better care of workingmen," but we must confess that the theory has been often shattered, and especially so in the light of recent events. We are led to believe, however, that there must have been something wrong somewhere, when the employees of such an institution as the one at Dayton, O., employing 2,300 people, surrounded by everything seemingly calculated to make the labor of an employee light and easy, the "model factory" of this country, should strike, for the reason that 4 of their number were discharged for cause. And yet, many of us looking back over the years when we were less fortunate than now can say from experience that we would have appreciated any effort on the part of our employers that would have made our burdens less heavy to bear. Gas companies have not been and are not now hampered with labor or industrial unions; the men grow up in the business, are well paid, and as a rule are satisfied. But, realizing the feeling of unrest on the part of labor in certain sections, the extent and importance of which seem to be growing with the commercial growth of the country, and in nearly every industrial pursuit to organize for so-called "protection," would it not be well for directors and managers of gas companies to seriously anticipate what is happening, and to consider ways and means which will continue that friendly relationship which we believe now exists between employer and employee of gas companies in this country. Consider the men employed at the works, and especially in a works where coal gas is made, and it will not be disputed that their labor while intermittent is nevertheless hard, and more intelligence is required than is possessed by most of them to know how to take proper care of themselves under existing conditions. They perform the duties assigned them, become heated, carelessly sit or lie down in a draught, and consequently, in disobedience to the laws of nature, pay the penalty of such carelessness with shortened lives.

Why not set apart at our works, whether for coal or water gas manufacture, a room, ample in size, to which the men, as they may be spared from their labors, can retire. Such a room should be equipped with lockers in which their good clothing, such as they would wear to and from their work, could be kept, each man being assigned his own locker, and to be held responsible for its order ahd cleanliness. In this room, or another convenient thereto, depending upon the size of the works and the number of men employed, there would be a bath tub and shower bath and other toilet conveniences, the foreman of each shift to be held responsible for the cleanliness at all times of such a room and the appurtenances therein. We might go even farther, and provide

facilities with which they could heat their tea and coffee, or other articles of food requiring heating or cooking. In addition to these we could reserve, if only a small portion of the yard, space where grass could be grown and kept green with a few shrubs scattered about, and possibly a few flowering plants. No man fit to be employed about such an establishment could but appreciate these things, and the expense in keeping them up would be insignificant. The condition of affairs I know would be in striking contrast with many of the works we have in mind; for, sad as it may be to relate, there are gas works in this country that we know of whose management do not provide even decent tools with which to perform the work and the results there are usually commensurate with what the workmen have to do with.

This liberality on the part of the management might be gradually extended to the office and shop employees, especially if both office and shop were in the same building, by the setting apart of a suitable room, neatly and substantially furnished, equipped with a billiard or pool table, or both; also a library table upon which could be found the daily papers, and some of the leading magazines and technical journals, such as relate to mechanical and scientific questions and to the gas business. Here employees could congregate evenings to read, smoke or talk and in other ways amuse themselves. Such a room once established I am sure would be willingly maintained by the men making use of it by small monthly or weekly subscriptions. The limit to which such a room and its contents could be extended would depend, of course, upon the number of employees to enjoy it. The questions you are undoubtedly asking yourselves are, would all this pay? would it be appreciated? Why not try it and find out; the experiment may be tried in piecemeal and would not cost much.

Mr. Nettleton, in his admirable address in 1887, referred incidentally to profit sharing. This is by no means a new question, for it has been successfully tried by large manufacturing concerns in Europe and in a few instances in this country. The only gas companies I know of as having given any plan a trial are the Columbus Gas Company, of Columbus, O., and the Grand Rapids Gas Company, Grand Rapids, Mich., upon a plan devised by Mr. Emerson McMillin. This plan consisted of "Additional compensation for continued and faithful service in the shape of non-interest and non-dividend bearing scrip," which scrip was "Redeemable only in the shares of the capital stock of the Company when presented in sums of $100 or any multiple thereof." Provision was made, "That when any employee shall have received from the Company direct, or have acquired by purchase from others, the aggregate sum of $300 of such scrip, such employee may then, so long as he continues to hold such scrip or the equivalent in the stock of the Company, at his option, receive any further reward in cash." I understand that the plan, in that comparatively few of the employees of the Company became actual stockholders, was not altogether satisfactory; yet "The effect of the plan was good, both upon the employee and to the credit of the Company in the community." This plan, while worthy of commendation, is not, it seems to me, altogether the right one, inasmuch as it admits of the barter and sale of scrip, and in which transaction the more shrewd individual would receive the benefits which were not intended for him. A plan that would give quicker returns in the shape of non-transferable stock or scrip. upon which dividends would be paid in cash, or the actual payment of cash, would, it seems to me, put the matter in such a shape as to give those the benefit whom we were seeking to reward. Would not some plan as would make an officer or employee of a company feel that he had an interest in his employer beyond that which he had to give in return for his compensation be desirable?

The question of profit sharing suggests also the establishment of building and loan associations for the benefit of employees. Like the other this is not altogether a new idea, although I am not advised that such an organization has been created for the benefit of the employees of gas works, except in St. Louis, Mo. I understand that there an association was started primarily for the benefit of the employees of the Company, but as they could not subscribe for all of the stock, outsiders were permitted to come in on the same terms. The admission of outsiders is, it would seem to me, an objection to the plan, and if necessary to the success of the association I would consider such a plan not as desirable as some other that might be devised. The purpose of this association was the accumulation of a fund from monthly dues, premiums, interest, fines, etc., which fund should be loaned to its members, or to persons not members, for the purpose of enabling them to erect or purchase homes. I understand that the following, in brief, is what was accomplished in part at the end of the first 100 months, omitting all outside stockholders: "Five employees cleared off mortgages amounting to $17,200, the interest paid by them to the association for loans averaging 3½ per cent.; 14 employees who did not borrow on their shares realized $11,803.56, paying them an average of 9 per cent. for the time their money was invested; 21 employees have loans aggregating $37,600; and 75 employees own 790 full shares, representing an investment of $30,000. And this does not represent the amount to which the association has been patronized by the employees, because so many of them remained in for the purpose of accumulating a little money, and then drawing it out to use for other purposes than building." Many of the members admit that they would have had nothing to-day were it not for the dues paid in. An association of this kind certainly tends to keep the men satisfied, for they feel that their interests are being cared for and the little money they are able to save is safely invested, while others would never have obtained a home but through this method. I have referred to this one association with which I have acquainted myself, for I believe it is worthy of consideration and possibly of imitation.

In line with these suggestions it certainly will not be out of place to refer to that most excellent work inaugurated and now being maintained by this Association. I refer to the School of Correspondence. This is, without doubt, the best work carried on by any similar association in this or any other country and stamps the American Association as being in the lead of all others in doing for the young men in our employ what they cannot but appreciate, for it presents opportunities of inestimable value and such as many of us would have so enjoyed the benefits of in our early experience. The work of this correspondence school should never be allowed to lag for want of support, and when the time comes for the r newal of subscriptions, I am sure that there will be no difficulty in realizing even more money with which to carry on this work than when the plan was first promulgated.

The establishment of an Association Library is to be commended, and every assistance possible should be given the Secretary to help carry on the work of what now is but the nucleus of that important part of our Association, for it will assist materially in its permanency.

There will be a report made here by a committee appointed 1 year ago upon the question of some general policy of advertising, and I shall endeavor to have it brought up sufficiently early so that it may receive your thoughtful and candid consideration. Briefly, a similar committee was appointed by the Ohio and Western Associations, and these committees have made their reports. The plan is to devise some satisfactory method by which knowledge of the various ways in which gas can be used will become universal, and by which means every company contributing will be benefited by the experience of those who know how to advertise. In some such way as may be proposed, all are benefited in general and each in particular.

In this connection, it appears to me that it would be advisable for this Association to take steps at this meeting looking toward some concerted action on the part of builders of gas apparatus and manufacturers of gas consuming appliances to make a creditable display at the World's Exposition, to be held in St. Louis, in 1903; and I recommend the appointment of a committee of 5 whose duty it shall be to represent this Association and to co-operate with other Gas Associations, if need be, to secure space in which there shall be a display of all gas making and gas consuming devices of all the manufacturers who may be prevailed upon to enter. It might not be practicable for gas making machinery to be erected, except in miniature or by models, but the whole scheme appeals to me as one that would attract the attention of the public, and would be a most excellent exemplification of what the condition of the gas business in this country is at the present day. It is not difficult to imagine that arrangements could be made whereby great good may be derived to all concerned by such a display as I am sure could be made.

Death has placed its hands heavily upon the membership of our Association during the year, having removed from our midst 8 active and 2 associate members. In their passing the Association has lost men of character and high standing, not alone in their respective communities where they were best known and most highly honored, for in more than one instance the influence of their lives has extended beyond the confines of locality. Their faces and forms were familiar upon occasions like this; we miss them now, and we shall continue to miss them, especially upon each recurring anniversary.

W. G. Abel, for many years Superintendent of the Atlanta Gas Company, Atlanta, Ga. He joined the Association October 20th, 1886; died December 21st, 1900.

A. C. Gandey, Superintendent of the Lambertville Gas Company, Lambertville, N. J. Became a member of the Association October 2d, 1891; died December 30th, 1900.

Harold Humphreys, New York city, N. Y.; associated with Messrs.

Humphreys & Glasgow. Joined the Association October 18th, 1899; death occurred February 12th, 1901.

David W. Crafts, Superintendent Northampton Gas Light Company, Northampton, Mass. One of the Association's oldest members, having become a member October 20th, 1875; death occurred March 12th, 1901.

Chas. C. Frye, Treasurer Lynn Gas Company, Lynn, Mass. Joined the Association, October 17th, 1883; death occurred, March 21st, 1901.

William Stacey, Vice-President Stacey Manufacturing Company, Cincinnati, O. He joined the Association, October 19, 1887; death came, June 17th, 1901.

James Slade, Superintendent Yonkers Gas Company, Yonkers, N. Y. Joined the Association October 17th, 1883; died June 18th, 1901.

George B. Neal, Treasurer and Manager Charlestown Gas Light Company, Charlestown, Mass. One of the pioneers of the Association, having become a member May 13th, 1874; death occurred, July 7th, 1901.

William E. Barrows, President Welsbach Company, Philadelphia, Pa. His membership dates only from October, 1899. Death occurred July 30th, 1901.

William W. Goodwin, President Goodwin Meter Company, Philadelphia, Pa. Another founder of the Association, having become a member, April 16th, 1873. Died, October 6th, 1901.

In this list of the dead of the year, members of the Association will observe the names of many veterans in the great enterprise which our Association represents. They have gone to their reward, full of years, full of honors, leaving untarnished names behind. However, there is one name, that of Humphreys, whose mere mention will bring tears to the eyes of those present who will recall his tragic death in the Nile while struggling to save his younger brother. He died in an attempt to save a life. He paid his last full measure of devotion; he laid down his life for his brother. A mere youth, athletic and strong, educated and brilliant, on his bridal tour, his death could not have been more tragic. The world was all before him. I have deemed it proper to make special mention of this brilliant youth taken from us in the morning of life. While we mourn all our dead of the year, we especially mourn Humphreys, the promising son of our respected and valued member.

I cannot refrain from expressing to you at this time my appreciation of the great honor I have at being selected for the brief period allotted to preside over your deliberations, and I shall endeavor to give evidence of that appreciation by assisting, in the capacity that has been given me, in making your sojourn here a profitable and an enjoyable one. And I desire also to extend my thanks and to express my obligations to the gentlemen who have so kindly contributed papers; for I realize that in nearly every instance these papers have been prepared from personal interest and a desire to aid in the success of this meeting.

Interesting Personal Reminiscences Recounted by Dr. Carl Auer von Welsbach Over the Development of the Gas Lamp that Bears His Name.

At the meeting this year (Vienna) of the German Association of Gas Engineers and Managers one of the pleasantest harmonies of the sessions was the address delivered by Dr. Carl Auer, Baron von Welsbach, whose theme was mainly concerned in the narrating of personal reminiscences connected with the development of the Welsbach lamp, which device has put upon him a fame that will live while gas is used for illumination. A summary of the address is appended, and we are indebted for the same to *The Gas World:*

In the early eighties he was engaged in the study of the chemistry of the rare earths, and the peculiar glow of many of these in a flame excited in him the most lively interest. Among these rare earths one, then known as erbia, behaved in a most remarkable manner. It did not give out, like all other substances, a whitish or yellowish light, but gave out a green light a circumstance for which science has even yet no adequate explanation to offer, and which is in itself of extraordinary interest, being absolutely comparable to the exceptional radiative powers of such substances as polonium and others which have been investigated during recent years. The green light is not distinctly visible from any considerable distance; but the spectrum of the light is most peculiar, being not continuous but arranged, as it were, in stripes. The study of the spectrum of the light emitted by the rare earths became of the first importance for the chemical study of these earths; but such quantities of these earths as could be gathered upon a platinum wire in the ordinary way are not sufficient to produce a spectrum of adequate brightness. The question, therefore, came up, how might the rare earths be arranged in a flame so as to obtain the maximum illuminating effect from limited quantities of the substance. The suggestion presented itself to impregnate cotton wool with the solution and to bring the ash of the impregnated cotton wool to incandescence. It was, however, apprehended that the experiment could not succeed for want of coherence in the resultant ash; but on its being tried the experiment did succeed. The oxides retained the form of the cotton wool. Professor Bunsen, of Heidelberg, on being told of this, shook his head and could hardly be brought to believe it possible that the oxide would do anything of the sort; and he was astonished beyond measure when shown a mantle made in this way.

On going through the series of the rare earths one was found which had an exceptionally high lighting power, till then practically unknown, since the substance in question—lanthania—had never been examined except in minute quantities upon platinum wire. It was this substance which suggested the idea of using such substances for lighting purposes on a large scale. The lanthania mantle was found, however, to have an unfortunate tendency to crumble to dust. The lanthania absorbed moisture and carbonic acid. The idea then presented itself of using some carrier for the lanthania, something which would not have so great an avidity for moisture and carbonic acid. The first substance tried for this purpose was magnesia. The speaker had long known how important it was in all such investigations that the substances mixed should be most intimately mixed in a kind of molecular mixture; and that in such mixtures the physical properties might present considerable modifications. So it was. White magnesia and white lanthania gave in this kind of mixture a dark brown mantle, the properties of which were different from those of its components. This mixture formed the first mantle which seemed capable of being used. The light was good; the efficiency was somewhere about that of a Siemen's regenerative burner; but the mantles sintered after about 70 to 80 hours' use, losing their porosity and becoming quite glassy and transparent; so that this series of experiments ended practically in failure.

It was clear, therefore, that magnesia was not sufficiently refractory to high temperature. Zirconia was next tried, with considerably better results. The light remained fairly constant, and the mantles lasted several hundred hours. This was encouraging, and was followed by experiments on thoria. The addition of thoria to rare earths brought up the brightness to a surprising extent. The experiments, as a whole, showed such peculiarities in the behavior of molecular mixtures of the rare earths that the speaker was led to apply to such mixtures the name of oxide alloys; and they clearly showed that some system of incandescent lighting was possible if the right mixture could be found. This point is emphasized, that at this stage of progress the desideratum was not a method of applying the heat for the production of light but a proper composition of the mixture to be heated, the properties of which could not be predicted from those of the components.

At the same time, the new method seemed to involve a setting aside of all the work that had been done by others with the view of increasing the candle power of gas; for now we were to use non-luminous flames and apply the high temperatures of these. The results were published in a lecture given to representatives of the Vienna press in the University laboratory, and met with a very encouraging reception. The name incandescent gas lighting was itself an invention of the Vienna press, appearing first in the *Neues Wiener Tagblatt*. On the other hand, there was a great deal of skepticism and confident ridicule. In spite of this the new mantles got increasingly into use, and a little new industry was developed.

At this stage Dr. Auer von Welsbach was not able to continue his work on the subject, but the work was carried on with rare ability by Herr Ludwig Haitinger, now Manager of the Austrian Incandescent Gas Lighting and Electric Company, Vienna, whose services should never be forgotten. He found the special value of the cerium compounds which had always been present in smaller or greater quantities, and he carefully examined the effects produced with varying quantities of ceria. Dr. Auer von Welsbach resumed his work and made many hundreds of experiments, but with little result; and on the whole incandescent gas lighting fell upon evil times, and the speaker had to become the solitary chemist of the factory at Atgersdorf. At this juncture repeated experiments failed to lead to any substantial improvement; but at length the speaker returned to that idea which he had long before applied to some extent, the use of thoria. Mixing thoria with ordinary mantle materials brought up the brightness, but the light fell off after 50 or 60 hours to a value no greater than that when no thoria was present. Why was this? Was thoria itself thoroughly known from the chemical point of view? A quantity of crude thoria happened to be available at Atgersdorf, and this was carefully examined. New chemical processes were soon devised for the treatment of it; and when the thoria was prepared in a purer form, something remarkable was observed. The purer the thoria was the less light did it give in a mantle, the purest thoria giving only 2 candles. The speaker

concluded from this, perhaps somewhat hastily, that thoria was not an element, but could be broken up; for the light giving component seemed to be left behind in the mother liquor after crystalizing the thoria out. But in the end it was discovered that this light-giving component was no other than ceria, which adhers to thoria with great obstinacy. The next step was easy; to make pure thoria salts, to mix them with differing percentages of ceria salts, and to find out which percentage worked best. This led at once to a mixture—99 per cent. thoria, 1 per cent. ceria—which gave 3 times the light of the former mixtures, and which was in all respects far more durable than any of them, and this is the mixture which is in use at the present time. This mixture set incandescent gas lighting on its feet again, and its subsequent history is well known. Many have been the attempts to prove that there was nothing new in it; but, at any rate, the speaker got no assistance from any knowledge of anything of the kind done before his time. As to why a mixture of 99 per cent. of thoria and 1 of ceria should act in this peculiar way, no explanation can be given; and we shall probably have to wait long for one. The best explanations that can be offered stand scarcely higher than mere analogies; but there are some analogies which may be of some service. It would appear as if the function of the thoria was to act as a refractory carrier, while the ceria was oxidized and reduced in rapid alternation, and that the proper proportion in the mixture depends on the pressure. At a pressure of 100 atmospheres considerably more than 1 per cent. of ceria would give the best results. The alternate oxidation and reduction of one of the two oxides, with the corresponding formation and decomposition of the oxide alloy, take place millions of times per second, and result in molecular shocks and ether disturbances which we recognize as light.

All mixtures which can be used in this way present the common character that the two components of the mixture do not resemble one another either from the chemical or the physical point of view. On the other hand, they are in a certain sense isomorphous, in so far as they crystallize together and form double salts, such as the thoria-ceria salts. Alumina and oxide of chromium form another pair which can be used, but which give much less light than thoria-ceria even in the state of oxide alloy or intimate molecular mixture. Alumina and oxide of chromium are pretty far from one another in the chemical series, and they form a series of double salts, the chrome alums. Another example is the blend of lime (or strontia) and oxide of uranium discovered by Herr Haitinger; and traces of uranium act in a similar manner with thoria. Small traces of uranium oxide confer a greatly increased emissivity upon lime, and the speaker has long thought of turning this to account. In this case the lime is the carrier and the uranium oxide is the easily oxidizable and reducible substance. In nature we find such compounds as uranite containing lime and uranium. The preceding analogy may prove a useful guide to further work and it does not in any way contradict any known facts.

The Development of the Bituminous Coal Industry.[1]

By Mr. William Gilbert Irwin.

There are no more interesting recitals in the annals of trade than that of the development of the fuel industries, for commerce and industry are very largely dependent upon the fuel supply. For many years the chief source of the world's fuel supply has consisted of those hydrocarbon compounds found in nature and known as coal. Scientists have long disputed over their origin, while in the me antime modern industry has adapted them to its various requirements, and as a result has brought about achievements scarcely dreamed of a century ago. In the diversified fields of industry from which the capitalist reaps his millions and the workman toils for the necessities of life the coal trade has played a most important part. In its development we see the mightiest struggles of genius, the boldest strokes of business stratagem, the most gigantic projects involving the expenditure of enormous capital, and the organization of great armies of employees. The coal trade has constantly undergone an evolution involving a struggle for "the survival of the fittest," whether that of inventive genius, mechanical superiority, labor or capital. In its adaptation to the uses of modern econc mic industry anthracite coal preceded bituminous, and of recent years the latter fuel and its products has had a much wider use in the iron and steel and allied industries, and present conditions foreshadow a continuance and even a rapid increase of this lead.

The original area of the anthracite coal fields in this country did not exceed 500 square miles, and embraced the great field in Eastern Pennsylvania and the comparatively unimportant fields in Massachusetts, Rhode Island, Colorado and New Mexico, while the bituminous fields already partially exploited in this country exceed 200,000 square miles, which shows conclusively that the latter coal is to form the fuel of the future.

Anthracite coal was first discovered in this country in Rhode Island in 1768, and in 1791 this fuel was discovered near Mauch Chunk, in Eastern Pennsylvania. The first discovery of coal in America was that of a bituminous vein near the present site of Ottawa, Ills., mentioned by Father Hennepin in 1679. The first coal mine opened in this country was a bituminous mine near Jamestown, first worked in the latter part of the 17th century. It is not the purpose of this article to trace these fuel industries through the period of their early development, but rather to trace the growth of the bituminous coal trade and the benefits which it has conferred upon modern industry.

The development of the bituminous coal industry up to 1850 was confined to the eastern part of the country. Then, as now, Pennsylvania held the lead, with Virginia, Illinois, Maryland and Ohio making up the residuum of the output. The soft coal production in 1850 was, in round numbers, 10,000,000 tons. As yet the railway development of the country had not really been begun, and the iron and steel industries not yet emerged from that period when charcoal formed the principal fuel. The coal trade then depended upon the rivers for transportation to the markets. In the development of the soft coal fields of Western Pennsylvania we can divide the industry into a number of epochs in accordance with the development of transportation facilities. The latter days of the 17th century witnessed the opening of small mines for local consumption; this was followed by the days of keel-boating down the Ohio and the Mississippi; about 1817 the flat-boating epoch began; in the early forties the development of the slackwater systems on the upper Ohio streams ushered in the days of steamboating as applied to the coal-carrying traffic; in the meantime the coking industry was undergoing its infantile vicissitudes. Then came the iron way of the railroad; lastly, the introduction of modern mining appliances and advanced mine engineering practice marks the highest point in the history of this great fuel industry.

Coming down to 1870 we find 19 States and Territories producing soft coal, and in that year the output was 17,000,000 tons Ten years later 25 States and Territories were producing 43,000,000 tons; by 1890 the number of bituminous coal producing States was 28, and the aggregate output for that year was 111,000,000 tons. During the past 10 years the industry has been devoloped in no new States, but many new fields have been exploited in the already soft coal producing States, as will be seen from the fact that the output for 1900 was, in round numbers, 208,000,000 tons. While, in part, the marvelous increase in the soft coal output for the past 10 years has been due to the development of new fields this is not entirely the case. During this period the introduction of the mining machine, the application of electricity and compressed air to mining operations, steel tipples and automatic tipple appliances, and the advancement of mining engineering, have had much to do with the development of the industry, as have the stimulating influences of the great industrial revival which this country has experienced during that time.

The Western Pennsylvania field, better known as the Pittsburg coal field, has during all these years maintained its lead with comparative ease, the production for 1900 being, in round numbers, 78,000,000 tons. Of the other principal coal States Illinois follows with 25,000,000 tons; West Virginia, 22,000,000; Ohio, 17,000,000; Alabama, 8,000,000; Indiana, 6,000,000; Kentucky and Iowa, each 5,000,000; Kansas, a little over 4,000,000.

According to geology the bituminous coal fields of our country are classed in 7 groups. The Triassic field embraces the Richmond basin in Virginia, and the Deep River and Dan River areas in North Carolina. The maximum output of this field was reached many years ago, and its present annual production does not exceed 50,000 tons. While not the largest in area, the Appalachian field far exceeds all other fields in importance, its annual production being about two-thirds of the entire bituminous output of the country. It embraces Central and Western Pennsylvania, Southeastern Ohio, Western Maryland, West Virginia, Eastern Kentucky and Tennessee, Northwestern Georgia and Northern Alabama. It contains the well-known Connellsville coking field, the Clearfield and Pittsburg gas and steaming coal seams, and the Monongahela field in Pennsylvania; the Blossburg and Cumberland fields in Maryland; the Pocahontas and New River fields in Western Virginia; the Fairmount, Flat Top, Kanawha, Georges Creek, Elk Garden and other important fields in West Virginia; the Massillon and Hocking fields in Ohio; the Jellico field in Kentucky and Tennessee; and the Birmingham field in Alabama. The central field, including the coal areas in Indiana and Illinois, and Western Kentucky, has a considerable area and a large production, as will be seen from the production of States given above. The Western field embraces the States of Iowa,

1. *Scientific American.*

Missouri, Nebraska, Kansas, Arkansas and Texas and Indian Territory. In extent it is the largest field in the country, and in production it ranks third. The Rocky Mountain field includes the coal areas in Colorado, Idaho, Montana, New Mexico, North Dakota, Utah and Wyoming. This field is rapidly increasing in importance. In 1887 the production of the field was about 3½ million tons. Within three years the annual output was doubled and the production for 1900 was, in round numbers, 14,000,000 tons. While California and Oregon produce small quantities of coal their combined annual output does not exceed 200,000 tons. The Washington field is being rapidly developed, and the output of the State has increased from 1,263,689 tons in 1890 to 2,418,834 tons in 1900.

The aggregate of the world's output of all kinds of coal for last year was about 800,000,000 tons. The production of bituminous coal in this country was more than one-fourth of the world's mineral fuel production. It exceeded that of Great Britain; was one-fourth greater than that of Germany; 5 times the production of Austria-Hungary; 6 times that of France; 14 times that of Russia and 50 times the production of Canada. All kinds of mineral fuel produced by Continental Europe last year exceeded our bituminous production by a little more than one-fourth. More than a third of a million men are employed in the bituminous coal mines of our country, while a like number are engaged in its shipment, in the manufacture of coke, fuel gas and other accessories of the industry, and in the other labor required in handling the product from the mines to the markets. The office forces of the concerns engaged in the industry aggregate thousands, and there are superintendents, foremen, fire bosses, engineers, electricians and thousands of other skilled laborers dependent upon the soft coal industry. The industry has stimulated the construction of thousands of miles of railway, and the great trunk lines of the country are reaping rich revenues from the bituminous coal carrying trade. The sum total of the capital invested in this great fuel industry makes another interesting recital.

The economic methods of coal mining and fuel operations already adopted in the Old World have been made necessary, because of the depleted condition of the coal fields there. So far as concerns the bituminous coal industry, there is no danger of an early depletion of the fields of this country, but this does not mean that we are not adopting the more economic measures in every department of the industry. Allowing for the variation of the bituminous coal measures of this country, which run from a little less than 4 feet to 8 or 9 feet in thickness, it would not be far out of the way to estimate a production of 10,000 tons to the acre, which would give our entire bituminous coal area a producing capacity of 1,280,000,000,000 tons. At the present rate of mining the depletion of this area would require something like 6,000 years. However, it must be remembered that thousands of acres of barren territory are embraced within this coal area, the mining operations extending over the past 60 or 70 years have been quite extensive and thousands of acres of coal have already been rendered unminable, and future operations will make it impossible to mine much of the coal. However, it will be seen that so far as concerns the bituminous coal supply this country has nothing to fear as to the future.

Already American bituminous coal is playing an important part in the export trade, and is being received with favor in Europe in competition with the Welsh product. Our exportation of bituminous coal has grown from 1,138,681 tons in 1890 to 5,411,329 tons in 1900. It has been only a few years ago that American coal was practically unknown in the European markets, while during the past year our soft coal was exported to 11 countries of Europe to the aggregate amount of over a quarter of a million tons. The scarcity of the Welsh product caused by the Boer war gave an impetus to the market for our soft coal in Europe, and it seems to have found a permanent market there. Last year our soft coal was exported to 50 countries, and American coke was sent to 22 foreign countries, the total exportation of this soft coal product being about 400,000 tons. Pennsylvania, West Virginia and Maryland bituminous coal figures most largely in the export trade owing to the advantageous location of the fields of these States with respect to the great Atlantic ports.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, October 10th, 1901.

A Lower Standard and Cheaper Gas.—A New Gas Fire.—Counting Money.—Taking Stock.

I have had occasion, more than once, to mention that there is a tendency towards cheaper gas of a lower sperm standard than is usually supplied, brought about by the increasing proportion of gas that is used for purposes other than lighting, and assisted by the increasing use of the incandescent light.

Scarcely any important meeting of gas shareholders has been held at which this point has not been in evidence. At the meeting of the Commercial Gas Company, London, held last week, the Chairman stated that since the introduction of the incandescent burner it was no longer important to consumers that the gas should be of a high illuminating power, and as enrichment was a very expensive process, indeed, it was obviously to the interests of users of gas for purposes other than lighting that gas should be supplied to them of a lower illuminating power and at a cheaper rate. The Company, therefore, proposed to supply gas at a 14 or a 15-candle standard instead of 16-candle, subject to a reduction of 1d. from the standard price for each candle below 16, and to apply for Parliamentary powers to carry out such an arrangement. In Scotland the Edinburgh Gas Commissioners have been considering a report from their Chief Engineer and Manager, Mr. W. R. Herring, on the question of reducing the illuminating power of the gas supplied from the different works. This gentleman almost goes so far as to say that even at the same price, a 20-candle gas is preferable, in the interests of the consumers, to a 25-candle. He points out that the lighting in English towns with 16-candle gas is better than that in Scottish towns with 25-candle gas, the reason of this apparent anomaly being that in the first case 5 cubic foot burners are used, giving an illuminating effect equal about to 14 or 15 candles, and in the second, 2 cubic foot burners, giving only 8 candles. The difficulty was that the burners at the command of the public were not particularly well adapted to the burning of gases rich in hydrocarbons. The higher the quality of the gas the greater the tendency to emit smoke when burnt in the ordinary way. A slight draught, such as that caused by the opening or closing of a door, was sufficient to cause the flame of a 25-candle gas to curl and to give off smoke in just the same way as an oil lamp easily smoked when improperly regulated. An instance of this was furnished by the condition of public lamps after a storm, parts of the glass being rendered almost opaque by the deposit of smoke and soot brought about by the wind finding access to the burner through the aperture left for the lighting rod. This undesirable effect could not be prevented, but it was possible, by supplying a gas that could be more easily consumed in the burners ordinarily procurable, to almost entirely do away with the present tendency of the Edinburgh gas to smoke, and for this reason it would be to the interests of the consumers if they would agree to adopt an illuminating power of, say, 20 candles. If such were agreed upon, the Commissioners could sell at 2d. per 1,000 cubic feet less, and they would not discover the difference in the illuminating power, owing to the conditions in which the gas was at present consumed, through old and defective burners which failed to yield anything like the full illuminating power that the gas was capable of giving, while the incandescent burner and the gas stove would be more efficiently served by a 20 than by a 25-candle gas. Mr. Herring also went somewhat fully into the costs of making different qualities of gas, which lead to very different conclusions than those usually accepted in England. He starts with the cost of 25-candle gas, and finds that 20-candle gas could be sold for 1.76d. less, and 16-candle gas for 3.37d. less. In England we start with the cost of 16-candle gas, and then calculate that of each additional candle, which may range from ¼d. up to 3d., according to circumstances, and it is only since the introduction of water gas and of cheap benzol that anyone has thought of enriching for less than 1d. per candle. Mr. Herring's figure is under 0.4d. per candle, and unless a better showing in favor of lower qualities can be made the case for the reduction is not very strong, and may lead to some satirical inquiries as to how it is that gas engineers have all at once become alive to the advantages of poor gas. Possibly its advocates have in view the introduction of some new process such as the Delwik, or a coke oven, in place of the ordinary retorts, that will admit of a substantial economy in manufacturing costs. The present selling price of gas in Edinburgh is about 1.5d. per candle, but according to the above figures a reduction in the standard would result in a considerable increase in the cost per candle. It would greatly strengthen the hands of those who advocate a reduction if they could show the consumer that it meant a reduced cost per candle, and this is more necessary in England than in Scotland, because the argument about a tendency to smoke does not apply to 16-candle gas.

A decided novelty is being placed on the market, in view of the coming winter season in the way of gas heating apparatus, under the title of the Clamond gas radiator. It belongs to the type of apparatus known as "gas fires" which may be described as imitating to a greater or less degree the ordinary coal fire, by providing a body of incandescent matter, that diffuses radiant heat in the same way as a mass of glowing coal. Apparatus of this kind may be extravagant as regards consumption of fuel or deficient in respect to that complete combustion which is necessary to obtain all the heat from the gas, but nevertheless there is a demand for it, and each winter season secures a distinct advance in the use of gas fires. The ordinary coal fire takes an hour or

two in getting up into proper working order and a similar difficulty arises when it is done with. One must either wait for the fire to burn itself out, or accelerate the process by turning the partly burned fuel under the hearth, or leave it to itself, all of which is open to objection. And therefore it is that a contrivance which can be lighted or extinguished to the minute, adjusted within certain limits to a regular consumption, and is always reliable, enjoys a considerable share of public favor. The new departure, which is being introduced by the Kern Burner Company, is an application of the principle, which has already effected a very marked result in regard to lighting, to that of heating. Robbed of all detail, it may be described as simply replacing the Welsbach mantle with a perforated fireclay tube, arranged vertically in rows of 5 up to 10, as may be desired. These tubes take the place of the asbestos lumps or fiber, and the claim advanced is that a larger proportion of the heat is obtained in radiant form, than with the old established arrangement. If the object of a gas fire is to furnish radiant heat, then the efficiency turns upon the percentage of the total heat that is obtained in that form, and looking at the superior results secured by the Kern burner with the Welsbach mantle, it is also feasible to expect some advantage from the fireclay tube. According to the claims of the makers there is an economy, as compared with the ordinary gas fire, similar to that of the Kern as compared with the "C" Welsbach burner, and if this can be realized in practice the already popular gas fire will receive a strong push ahead. They claim that a combination of fire tubes, each requiring 2 cubic feet per hour or an aggregate consumption of 10 cubic feet of gas, will warm an average size apartment, and if this can be substantiated they are on easy terms as regards competition with coal or coke at the current retail prices, and gas engineers will feel they have something that can be recommended without any reservation on the score of extravagance when in continual use. I have not had an opportunity of personally examining or testing the Clamond gas radiator, but hope to do so before sending the next American letter.

It is an old saying that one industry begets another, and the automatic meter department is no exception. Various devices have been brought forward with a view of facilitating the collection and checking up of the large quantity of coin to be dealt with. Those who have introduced the penny-in-the-slot to any considerable extent have found it necessary to use large bags and send round at stated periods during the day to relieve the collectors, the services of hand trucks or of donkey carts being called in. One firm has placed a specially made hand truck on the market, consisting of a lock up box mounted on light bicycle wheels with push handles. And having obtained the coppers and counted them up there is the question of disposing of them, and at least one enterprising gentleman is open to take this matter in hand. The difficulty is not so acute where a longer unit such as the shilling is used, but even that is a question of moment. Last week £168 in shillings were collected in my own district, and the labor involved in counting, checking and banking the same was no small drain on the staff, and makes one feel thankful that we deal with shillings and not pence. With the shilling, the collector can usually bring in his own spoils without the assistance of a porter to meet him at agreed times and places. As regards counting, I believe a kind of cheque table or draught board arrangement is largely used abroad, for expediting the process. A London firm of meter manufacturers has brought out a counting machine, by means of which the coins are placed into small slots or pockets and transferred to bank money bags of the usual pattern.

The operation of taking stock once a year, or at any fixed period, is one that requires careful attention and that should be verified by actual measurement or calculation. This is particularly the case with regard to coal which is usually weighed into stock by the ton, and into the retort house by the hundredweight. Neglect of this point has been the cause of an unpleasant predicament at a town in Scotland, where the gas manager was called upon to account for a shortage or missing quantity of coal to the extent of over 400 tons in weight and £540 in value. His explanation of the matter was that he had inadvertently neglected to allow for shrinkage, and for the fact that a few pounds was allowed on each barrow in taking it over the steelyard. In the course of a year the barrows passed over that machine 28,000 times and allowing 5 pounds excess on each barrow, about 60 tons per annum would be represented.

This had been going on for 7 years and would account for the deficiency. So far the explanation is perfectly clear. The coal may be weighed in by the cartload of 30 cwt., the maximum error or overweight on which would be 14 pounds, or less than 0.5 per cent. In weighing out in barrow loads of 2 cwt., the workmen add a shovelful to "turn the scale," and the excess may amount to 5 pounds or 2 per cent. But even a fair allowance for turning the scale is not sufficient, unless the operation of loading is under more strict supervision than is possible in most gas works. The best plan, where the arrangements will admit of it, is to work the old stock out at intervals not too far apart. Take the quietest time of the year, say the month of June, and have all coal being brought in, which should be as little as circumstances will permit, tipped in one stack away from the rest. Go on using that previously in stock till exhausted, which may be by 6 A.M. on the 27th inst. You then know two things – that on the 1st of June there was sufficient coal in stock to supply the requirements from June 1st to 27th, and the weigh book furnishes the weight of coal in stock on the 27th of June. However carefully the weighings inward and outward may be taken, there is the fact that coal is subject, from various causes, to changes in weight in the course of storage extending over some months. Coal weighed in during a wet spring, will not weigh out at the same in the hot, dry days of summer. The stock of coal can be estimated by cubing, that is by calculating its bulk and dividing by an assumed factor, usually 40 or 42 cubic feet per each ton. But this is liable to variation to the extent of several units per cent. according to the size of the coal and other conditions, and the only safe plan is that of working out the stock. The moral is capable of a very wide application and many a mental and moral shipwreck can be traced to looseness as regards "taking stock." As regards account keeping, it is a most important item. Accounts may be kept to the penny, but the results entirely frustrated by a tendency to put the stock down at what it "ought to be" rather than what it is.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

MR. A. B. SLATER, JR., who has been engaged on his own account for some time in the business of consulting and constructing gas engineer, has removed his offices from 33 Adelaide avenue, Providence, R. I., to room 209, Equitable Building, Boston, Mass.

THE Riter-Conley Manufacturing Company, of Pittsburg, Pa., has completed plans for the construction of adequate works on a very eligible site recently purchased by it at Leetsdale, some 15 miles from Pittsburg. The plot lies between the Ohio river and the tracks of the Pittsburg, Fort Wayne and Chicago Railroad.

THE Board of Gas and Electric Light Commissioners of Massachusetts has named the 1st prox. as the date for the public hearing over the petition of Mayor French, of Gloucester, asking that the Gloucester Gas Light Company be obliged to lower its selling rates.

MR. FREDERICK COOK has been chosen to succeed the late Mr. J. Lee Judson as President of the Rochester (N. Y.) Gas and Electric Company. Mr. Cook was First Vice-President. Mr. Charles B. Judson was elected First Vice-President, and Mr. Junius R. Judson was elected a member of the Board of Directors.

MR. S. B. HOVEY, Secretary and Treasurer of the Fairfield (Ia.) Gas and Electric Company, is superintending the improvements that are being made upon its plants. Mr. Hovey, who is a resident of Independence, is determined that the public of Fairfield shall have nothing to complain of respecting its artificial lighting supply.

MR. CHARLES D. HAUK and others have petitioned the authorities of Youngstown (O.) for the right to there operate a gas works. Their attempt is not likely to succeed; at least so writes the correspondent who forwarded us the information.

THE Hudson County (N. J.) Gas Company is said to be contemplating the good policy of extending its main system to the town of Fort Lee.

"R. L.," writing from Detroit, (Mich.) under date of the 18th inst., says that Messrs. William A. Smith, of Grand Rapids, George Brackett, of Charlotte, and Earl Brackett, of Pitoskey, are planning for the construction of a gas plant at Petoskey, Mich. The Company is capitalized in $100,000, and the aims of promotors are quite ambitious, in that they include the furnishing of gas to many of the summer resorts on Little Traverse Bay. It may be that the venture will prove a paying one; but such a happy consummation is on the doubtful order.

THE proprietors of the Detroit Suburban Gas Company, which was formed for the purpose of supplying the villages of Springwells, Woodmere and Delray, which places are not far from Detroit's city limits, have secured a site for the works on Kercheval avenue, Delray, at a point close to the tracks of the Wabash Railroad. It is said that con-

struction work will be commenced at once. The officers of the Company are: President, Charles M. Warner, Syracuse, N. Y.; Vice-President, M. Liebel, Erie, Pa.; Secretary, J. P. Cowing, Cleveland, O.; Treasurer, M. F. Bramley, Cleveland, O.

MR. CHARLES B. WHITING, for several years in charge of the meter department of the Boston (Mass.) Gas Company, died at his home in Boston, the morning of the 14th inst.

AT the annual meeting of the Troy (N. Y.) Gas Company the Directors elected were: A. E. Bonesteel, A. N. Brady, Thos. Breslin, Fred. E. Draper, James Flemming, Samuel A. Gleason, George P. Ide, Wm. Kempf, F. J. Molloy, Edward Murphy, Jr., Robert C. Pruyn and W. A. Thompson.

AT the annual meeting of the Shenandoah (Pa.) Citizens Gas and Water Company the following officers were elected: Directors, T. R. Beddall, F. C. Reese, E. J. Wasley, W. M. Brewer, M. Mellet, C. E. Titman, J. P. Roberts, J. S. Callen and George W. Wasley; President, T. R. Beddall; Treasurer, E. J. Wasley; Secretary, F. C. Reese.

THE Atlas Pipe Wrench Company, of New York and San Francisco, was exceptionally successful in securing official recognition of the specialties shown by it at the Pan-American Exposition. Its display consisted of several well arranged specimens of Atlas pipe wrenches and Atlas tube cleaners for water tube boilers. Each class of exhibits was awarded the highest mark given in their respective divisions—a bronze medal.

A CORRESPONDENT in St. Louis, Mo., forwards the following: "Early this month a franchise was sanctioned by the authorities of Guthrie, Oklahoma, by virtue of which Mr. William H. Frost, of Fort Scott, Kansas, is authorized to construct, operate and maintain gas works in the city of Guthrie for a period of 21 years, and to that end to use all the streets, alleys and public grounds of the city (under the direction of the Mayor and Council), for the laying of pipes, mains and conduits and erecting lamp posts and other structures for conducting and furnishing an adequate supply of gas for lighting, heating, manufacturing and power purposes. The grantee may charge a maximum rate of $2.25 per 1,000 cubic feet of gas; provided, however, that when the annual sale of gas amounts to 25,000,000 cubic feet the price shall be reduced to $2 per 1,000 cubic feet, and when the annual sales of gas amount to 30,000,000 cubic feet the price shall be reduced to $1.75 per 1,000 cubic feet. One odd provision in the franchise is that if there is any material reduction in the price of coal hereafter the price of gas shall 'be reduced accordingly.' In consideration of the granting of this franchise said Frost and his associates agree to furnish gas for use in the city hall and fire station free of charge. Section 4 of the franchise reads: 'The main pipes and conduits shall not interfere with any sewer or gas mains now laid, and extensions shall be made, wherever there shall be $100 revenue per annum for every 500 feet.' The 5th section directs that said Frost and his associates shall file with the City Clerk a written acceptance of this ordinance within 30 days after its passage, and shall deposit with the City Clerk $500 in cash; that money to be forfeited to the city should Frost fail to carry out his contract and complete the plant by December 1, 1902. 'Strikes and labor troubles are a part of this consideration.' Mr. Frost was formerly Manager of the Fort Scott Light and Fuel Company, which concern is being or has been reorganized through foreclosure proceedings brought about by failure to pay interest on its bonded debt."

A RECENT issue of the San Francisco (Cal.) *Examiner* said: "Competition in supplying gas to private consumers has induced the San Francisco Gas and Electric Company to carry the fight into all districts of the city regardless of the proximity of the new rival, the Equitable Gas Light Company. Following the voluntary reduction of 5 cents per 1,000 cubic feet, made some time ago by the old Company, a new plan has been adopted. Special agents of the Company are distributing contracts throughout the city, binding the San Francisco Gas and Electric Company and its ally, the Pacific Gas Improvement Company, to supply gas to private consumers at the rate of $1.25 per 1,000 cubic feet—provided the consumers will sign a 2-year contract—if in that time the competing Company should offer to sell gas in the district its price will be met."

IT is said that the betterments now under way on the plant of the Bangor (Me.) Gas Light Company will be completed by January 1st. A notable feature of the improvements is a 400,000 feet holder, which is being constructed by Messrs. R. D. Wood & Co., of Philadelphia.

A WATER gas plant is to be installed in the works of the Consolidated Gas and Electric Light Company, at Woodland, Cal.

THE Colusa (Cal.) Gas and Electric Company is to install a new water gas set.

IN the franchise granted to Mr. Frank K. Lane and his associates for the construction and operation of a gas works in Charles City, Ia., it is stipulated that the life of the grant is for 25 years; that the works and mains necessary for the purposes of the Company shall be completed within the period of 18 months after the signing of the ordinance (October 14th); and that no charge in excess of $2, "for an equivalent of 1,000 cubic feet of good coal gas of 16-sperm candle standard" shall be made. No meter rent may be charged. It is also declared "that in the location of such works the City Council reserves the right to require that the same shall be so placed as not to endanger the health, property, security or safety of said city, or the inhabitants thereof; and may, if they see fit, forbid the erection of such works in any locality as would in their opinion have such a tendency."

CHARLES CITY is the capital of Floyd county, Ia., and is located on the Cedar river, at a point about 110 miles west-northwest of Dubuque. The Iowa and Dakota division of the Chicago, Milwaukee & St. Paul Railroad goes through the place, and it is also on the line of the old Illinois Central road. It holds several manufacturing establishments, and its population is not in excess of 4,000.

AT a meeting of the Directors of the Wilmington (Del.) Coal Gas Company, held last Monday, the resignation from the Board of Messrs. A. H. Poole, H. C. Jones and Edward Bringhurst, Jr., was accepted. Messrs. W. Lobdell, Ed. Mitchell and H. M. Barry were elected to the vacancies.

A CORRESPONDENT forwards the following, from New Orleans, La.: "Some days ago, when the hour was rung notifying the day shift men in the works of the New Orleans Lighting Company, at Gravier and Perdido streets, that their time was up, a rush was made by them for the office. It was not pay night, and Mr. Wm. R. McDonald, Superintendent of the stove department, was unable to account for this apparently prearranged movement, except that it was a strike, which had been organized without his knowledge or without his having received any intimation of it. The men stationed themselves in the rather small office, and Mr. P. W. Aitken stepped forward and addressed Mr. McDonald. The first few words Mr. Aitken spoke contained no intimation of what was to follow, and Mr. McDonald was preparing himself for something unpleasant, but soon his impressions changed and he became still more surprised. Mr. Aitken said: 'Mr. McDonald and Fellow-workmen of the New Orleans Lighting Company: We have assembled here this evening for the purpose of taking upon ourselves a duty—but a pleasant one, I must assure you—which must come as a surprise to many. Several days ago we were informed that you, our honored head, were to sever your connection with the stove department of the New Orleans Lighting Company, and, knowing as we did your efficient management of this department and your kind treatment of the men under your employ, we felt that we could not let you part from us without at least a small token of esteem in which the employees under your supervision have always held you. I was appointed chairman of this committee, and, as such, wish to present you with this small memento. In presenting you with this, Mr. McDonald, I express not only my own, but the unanimous respect and esteem in which you are held by all of your employees. Mr. McDonald, time has wrought many changes, and you have been promoted from your position in the works as our supervisor and master mechanic to a higher position in the office of the New Orleans Lighting Company; and while we feel proud of your advancement, yet we feel that in losing you we lose a valuable man to our department, and, therefore, wish to present you with this memento, that would be ever watchful, in the way of a surprise, 'that time does tell when you hear that bell that the hour of 6 has come.' The men here this evening are those whose work is done. We hope that you will accept this timepiece with a hearty welcome, cherish and prize it, and may it act as a time guard to you in all matters of business; and, to conclude, may the light of your eye, as it flashes upon the face of its dial, be as bright as the light of the New Orleans Lighting Company since its inauguration when it flashed into the life of the people—light!' At the conclusion of his remarks, Mr. Aitken handed Mr. McDonald a magnificent 18 karat gold watch and a handsome gold chain. Mr. McDonald for a few moments was unable to reply, and then said that he had been so taken by surprise that he could not just at the moment find words to respond fittingly. He thanked the men and wished them godspeed in all their undertakings. The watch was inscribed on the inside case as follows: 'By the Employees of the New Orleans Lighting Company, to Mr. William R. McDonald, Oct. 18, 1901,' and on the outer case was the monogram of the recipient, 'W. R. McD.' The gift was a token of the esteem in which Mr. McDonald is held by his employees, and they sincerely regret that he is to sever his connection with them; that is, as far as working under his immediate supervision is concerned."

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
EDITORS.

CHAS. E. SANDERSON,
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The Market for Gas Securities.

A decided drop in market values for city gas shares was the feature for the week, and the decline is quite unaccountable in the shape of valid evidence for it. Consolidated closed today (Friday) at 215 to 215¼. It might be that some of the speculators have taken a chance on the short side, but of such selling there is no proof. We would rather buy than sell, even for a short turn. The pegging gentlemen have "pegged" Mutual at 298 to 302, which figures are ridiculously short of its real value. City gas bonds in general are nominally weaker.

Brooklyn Union is reported at 205 to 212, which quotation in fact means nothing as far as value is concerned. Another weak feature was Peoples, of Chicago, which was quite oversold on the thought that a recent decision of one of the "higher courts" of Illinois would foreshadow the determination of the State to tax the franchises of certain companies, in which the Peoples was included. Consolidated, of Baltimore, has recovered some of its quoted lost strength. The general market is dull and unsettled.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

OCTOBER 28.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	215	215½
Central Union, Bonds, 5's.	3,000,000	1,000	109	110
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	115	118
Metropolitan Bonds	658,000	..	108	112
Mutual	3,500,000	100	298	302
" Bonds	1,500,000	1,000	00	102
Municipal Bonds	750,000	..	..	.
New Amsterdam Gas Co. ..				
Bonds, 5's	11,000,000	1,000	107	107½
Northern Union, Bonds, 5's.	1,250,000	1,000	106	108
New York and East River..				
Bonds 1st 5's	3,500,000	1,000	111	115
" 1st Con. 5's	1,500,000	.	109	111
Richmond Co., S. I.	348,650	50	100	..
" Bonds	100,000	1,000	103	..
Standard	5,000,000	100	130	135
Preferred	5,000,000	100	150	155
Bonds, 1st Mortgage, 5's	1,500,000	1,000	118	..
Yonkers	299,650	500	130	.
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	205	212
" " Bonds (5's)	15 000,000	1,000	119	119½
Bay State	50,000,000	50	⅞	1
" Income Bonds	2,000,000	1,000	.	75
Binghamton Gas Works	450,000	100	28	30
" 1st Mtg. 5's	509,000	1,000	95	96
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	6	7
" " Bonds, 5's	5,250,000	1,000	69	72
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Central San Francisco	2,000,000	..	106	108
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Cincinnati Gas & Elec. Co.	20,500,000	100	104⅛	104¾
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	106	107
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	60	65
Preferred	3,026,500	100	84	86
Consumers, Jersey City Bonds	600,000	1,000	102	103
Consumers, Toronto	1,700,000	50	218	225
Consolidated, Baltimore	11,000,000	100	62	62½
Mortgage, 6's	3,600,000	..	..	115
Chesapeake, 1st 6's.	1,000,000	..	..	..
Equitable, 1st 6's.	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N.J.	1,000,000	100	12	14
" Con. Mtg. 5's	380,000	1,000	79	83
Consolidated G. & E. Co.'s., Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co	4,825,500	50		89
" Prior Lien 5's	5,603,000	1,000	99½	100
Detroit Gas Co., 5's	381,000	1,000	89	89½
" Inc. 5's	16,000	100	94	94½
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	34	38
Fort Wayne	2,000,000	..	..	.
" Bonds	2,000,000	..	50	54
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	102	104
Hartford	750,000	25	240	250
Hudson County Gas Co., of New Jersey	10,500,000	..	25	..
" Bonds, 5's	10,500,000	..	101	103
Indianapolis	2,000,000	..	67	71
" Bonds, 6's	2 650,000	..	99½	101½
Jackson Gas Co	250,000	50	65	70
" 1st Mtg. 5's	290,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	92½	95
Preferred	2,500,000	100	100	110
Bonds	10,000,000	1,000	..	108½
Lafayette Gas Co., Ind.	1,000,000	100		60
Bonds	1,000,000	1,000	48	55
Louisville	2,570,000	50	110	120
Madison Gas & Elec. Co.				
" 1st Mtg. 6's	350,000	1,000	102½	108
" 6 per cent. scrip, due 1910	100,000	25	87	89
Montreal, Canada	2,000,000	100	182	184¾
Newark, N. J., Con. Gas Co	6,000,000	..	..	55
Bonds, 6's	4,600,000	..	..	103
New Haven	1,000,000	25	300	325
Nashville Gas Lt. Co.	1,000,000	100	110	..
Oakland, Cal.	2,000,000	..	46	47
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	103⅛	103¼
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	
Rochester Gas & Elec. Co.	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	46	46½
St. Paul Gas Light Co.	1,500,000	100	60	63
1st Mortgage 6's	650,000	1,000	82	85
Extension, 6's	600,000	1,000	.	..
General Mortgage, 5's	2,465,000	1,000	86	88
St. Joseph Gas Co.				
" 1st Mtg. 5's	751,000	1,000	93	96
Syracuse, N. Y.	1,750,000	100	17	19
Bonds	1,612 000	1,000	91	93
Washington, D. C	2,600,000	20	315	320
First mortgage 6's	600,000	..	..	..
Western, Milwaukee.				
Bonds, 5's	4,000,000	..	107	108½
Wilmington, Del.	600,000	50	232	..

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DIVIDEND NOTICE.

OFFICE AMERICAN LIGHT AND TRACTION CO., JERSEY CITY, N. J., October 22, 1901.

The Board of Directors has this day declared a quarterly dividend of 1½ per cent., for the quarter ended September 30, 1901, on the preferred stock of the Company, payable December 2, 1901, to preferred stockholders of record at the close of business on November 9, 1901, at which time the transfer books of the preferred stock will close, and will remain closed until December 3, 1901. Checks will be mailed.

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As Superintendent or Assistant

In coal, water or oil gas works. Has practical experience in construction, manufacture and distribution for 20 years. Best of references. Address, "PROGRESS,"

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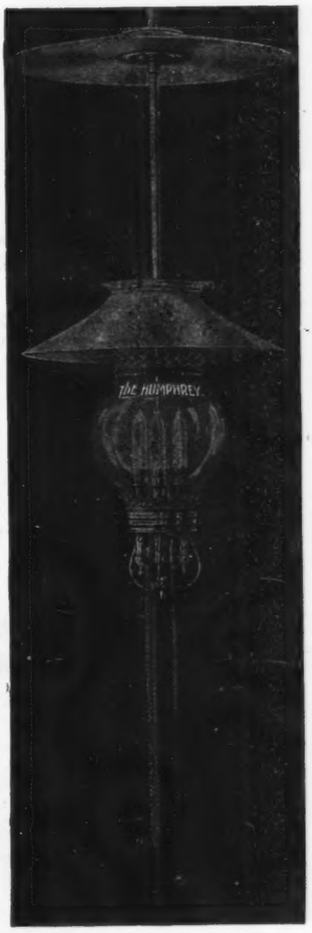

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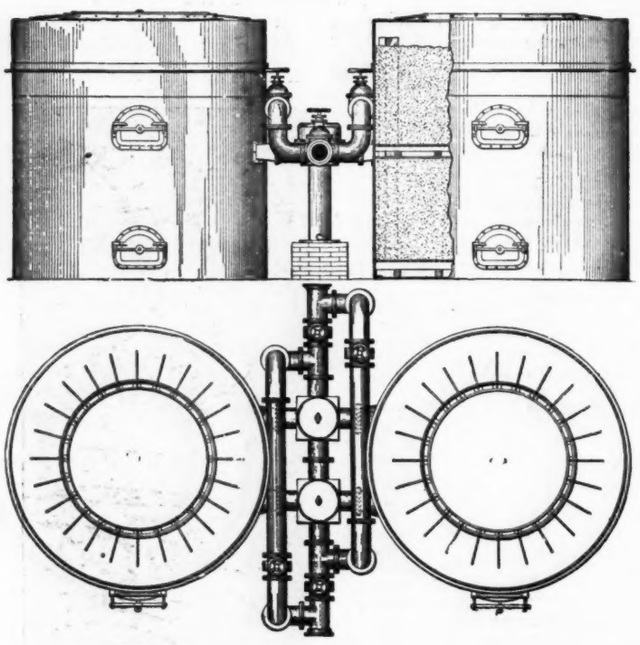

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Toronto	250,000
Ottawa	250,000
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Belleville	250,000
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Kingston, Pa.	125,000
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Peterborough, Ont.	250,000
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St. Catherine's (Second Contract)	250,000
Buffalo, N. Y.	2,000,000
Winnipeg, Man.	500,000
Colchester, England (Second Contract)	300,000

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York, England	750,000
Rochester, England	500,000
Kingston, Ont.	300,000
Crystal Palace District, England	2,000,000
Duluth, Minn.	300,000
Caterham, England	150,000
Enschede, Holland	150,000
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Kingston-on-Thames, England	1,750,000
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Stretford, England	500,000
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York, England (Second Contract)	750,000
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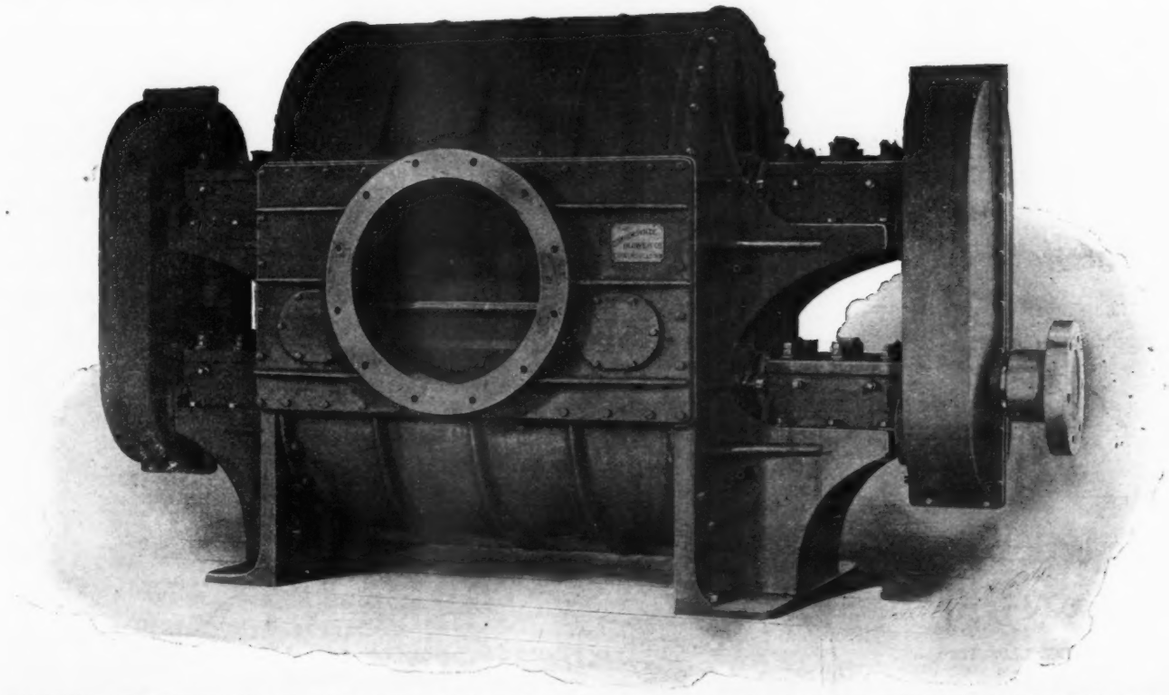

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FORMERLY

120-122 Liberty St., New York,

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Rutherford, N. J.,

Where all Correspondence should be Addressed. . .

Rutherford is on Erie R. R., nine miles from New York. Telephone, 6-M Rutherford. October 10, 1901.

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BY JOHN HORNBY, F.I.C. Price, $2.50.

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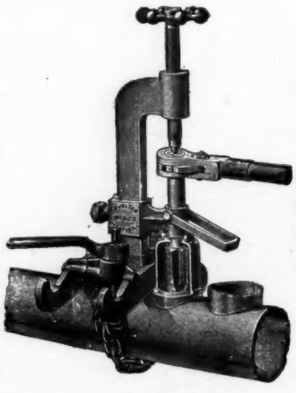

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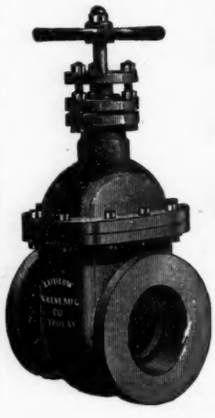

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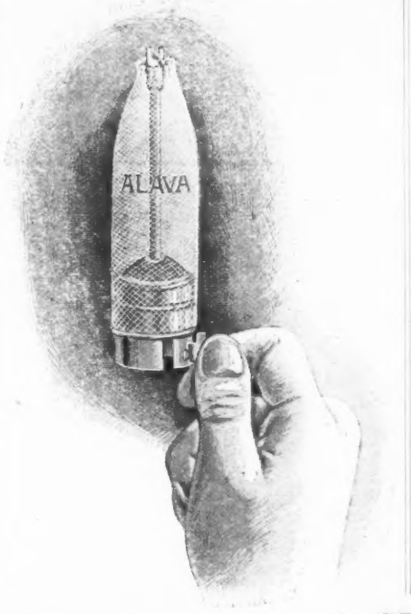

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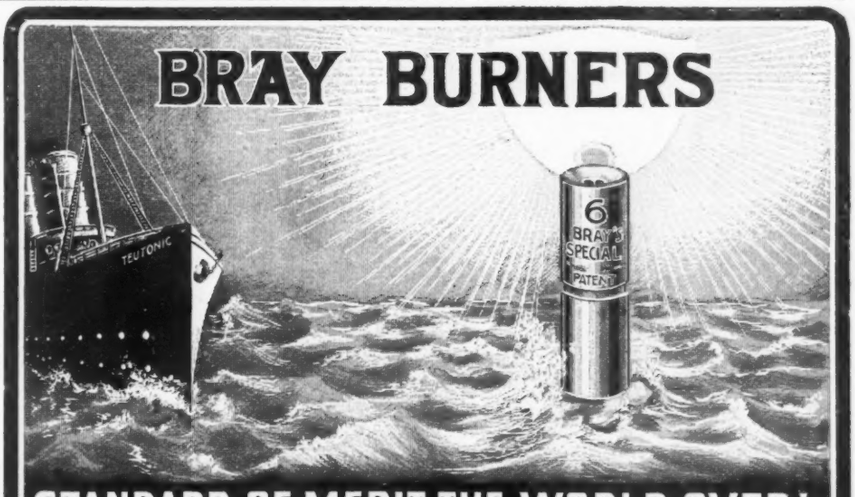

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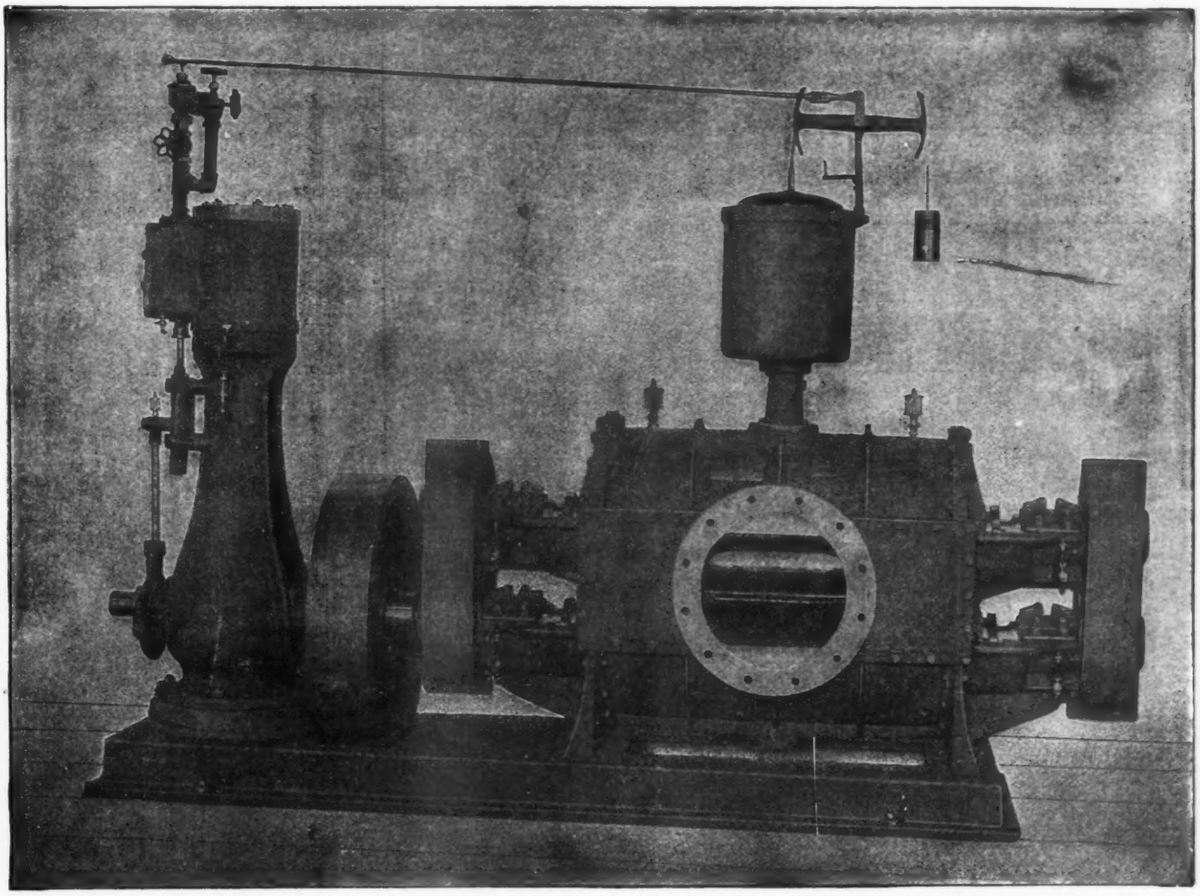

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Established 1856. Works at Phillipsburgh, N. J.

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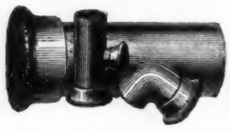

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FROM THREE TO FORTY-EIGHT INCHES DIAMETER. ALSO, ALL SIZES OF

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THREE SLOTS.

THE 3-SLOT ADJUSTMENT of the ATLAS PIPE WRENCH is the simplest and most effective adjustment of any PIPE WRENCH manufactured. No exasperating delays caused by threads or nuts being burred, rusted or clogged with dirt. THE SLOT ADJUSTMENT SAVES ALL THAT TROUBLE. The "ATLAS" grips the pipe quickly and positively, and releases readily

IT NEVER LOCKS.

Made in four sizes: 10-inch, 18-inch, 24-inch and 36-inch, handling everything from ¼-inch wire to 4½-inch pipe. Write for descriptive folder and price list. Ask your Supply Man for the "ATLAS."

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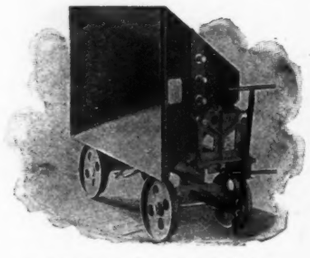

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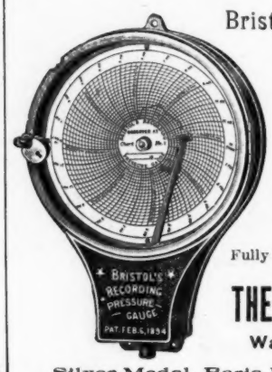

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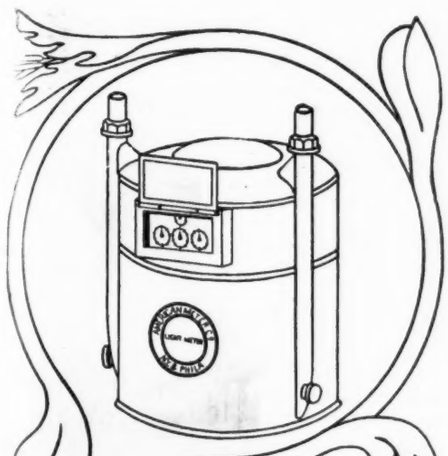

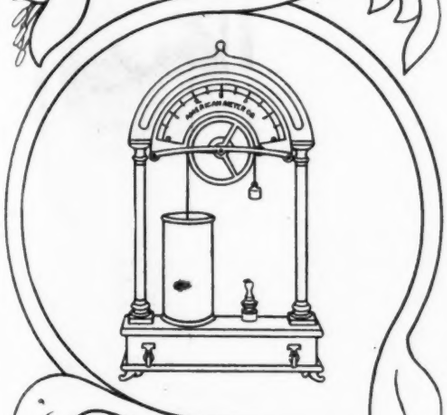

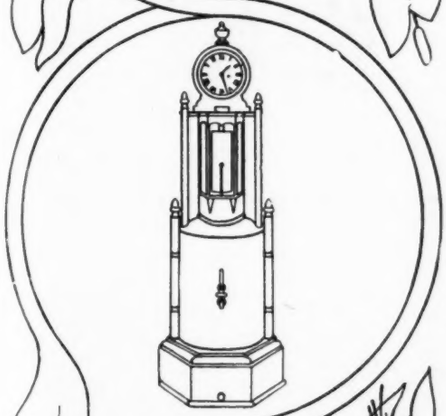

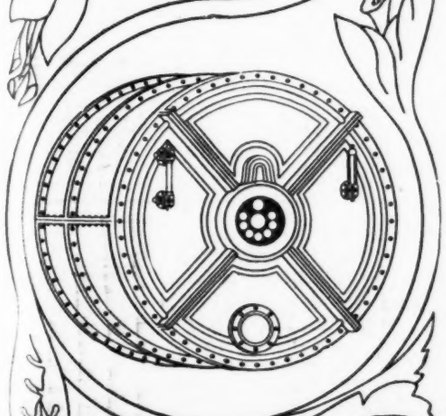

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NEW YORK AND PHILADELPHIA,

CHICAGO, ST. LOUIS,

SAN FRANCISCO.

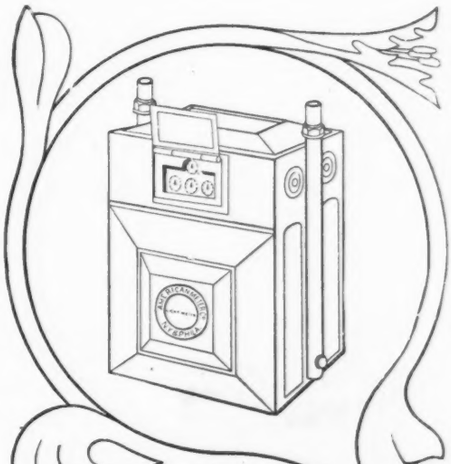
PUBLIC LIGHTING TABLE.

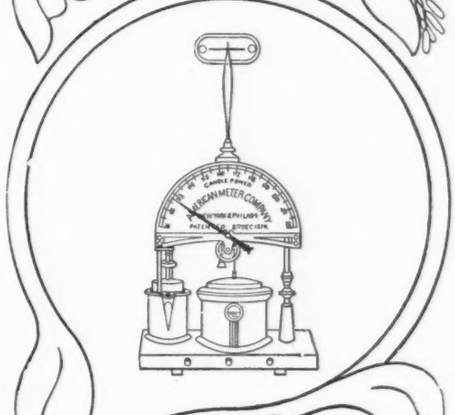
NOVEMBER, 1901.

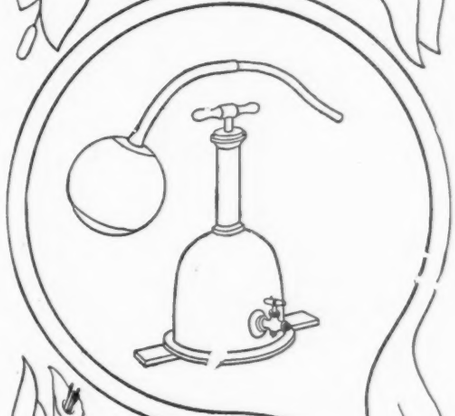
Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Following the Moon. Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. New York City. All Night Lighting. Extinguish.
				P.M.	A.M.
Fri.	1	5.30 PM	11.00 PM	4.45	5.35
Sat.	2	5.30 LQ	12.00	4.45	5.35
Sun.	3	5.20	1.10 AM	4.45	5.35
Mon.	4	5.20	2.10	4.45	5.35
Tue.	5	5.20	3.10	4.40	5.45
Wed.	6	5.20	4.10	4.40	5.45
Thu.	7	5.20	5.40	4.40	5.45
Fri.	8	5.20	5.40	4.40	5.45
Sat.	9	5.20	5.40	4.40	5.45
Sun.	10	5.20 NM	5.40	4.40	5.45
Mon.	11	5.20	5.40	4.40	5.45
Tue.	12	5.20	5.40	4.30	6.00
Wed.	13	5.20	5.40	4.30	6.00
Thu.	14	5.20	5.40	4.30	6.00
Fri.	15	7.20	5.40	4.30	6.00
Sat.	16	8.20	5.40	4.30	6.00
Sun.	17	9 20	5.50	4.30	6.00
Mon.	18	10.20 FQ	5.50	4.30	6.00
Tue.	19	11.20	5.50	4.25	6.00
Wed.	20	12.30 AM	5.50	4.25	6.00
Thu.	21	1.40	5.50	4.25	6.00
Fri.	22	2.50	5.50	4.25	6.00
Sat.	23	4.00	5.50	4.25	6.00
Sun.	24	No L.	No L.	4.25	6.00
Mon.	25	No L. FM	No L.	4.25	6.00
Tue.	26	No L.	No L.	4.20	6.10
Wed.	27	5.10 PM	7.30 PM	4.20	6.10
Thu.	28	5.10	8.40	4.20	6.10
Fri.	29	5.10	9.50	4.20	6.10
Sat.	30	5.10	10.50	4.20	6.10

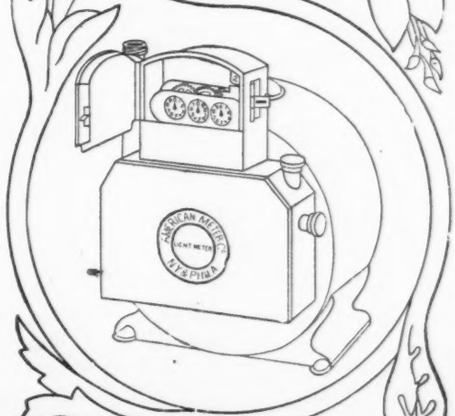
TOTAL HOURS LIGHTING DURING 1901.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	220.10	January	423.20
February	192.30	February	355.25
March	180.00	March	355.35
April	158.30	April	298.50
May	140.40	May	264.50
June	135.40	June	234.25
July	138.00	July	243.45
August	156.20	August	280.25
September	174.40	September	321.15
October	202.30	October	374.30
November	220.40	November	401.40
December	241.30	December	433.45
Total, yr.	2161.10	Total, yr.	3987.45





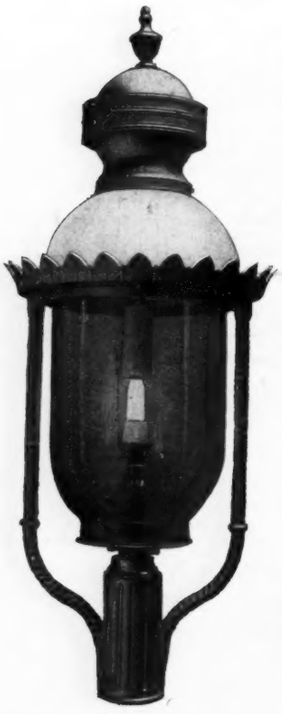




NEW YORK, 33 Nassau Street. PHILADELPHIA, Broad and Arch Streets. CHICAGO, Foot of Orleans Street. BOSTON, 624 Tremont Building.
CLEVELAND, 809 Cuyahoga Building. ST. LOUIS, 712 Roe Building. SAN FRANCISCO, 712 Polk Street.

WELSBACH STREET LIGHTING COMPANY

.... OF AMERICA ....



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Which includes its specially DESIGNED AND PATENTED BURNER for STREET and PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 150 Cities and Towns.

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POINTS OF MERIT:

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IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

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The most practical, efficient and artistic burner yet produced. . . . . .

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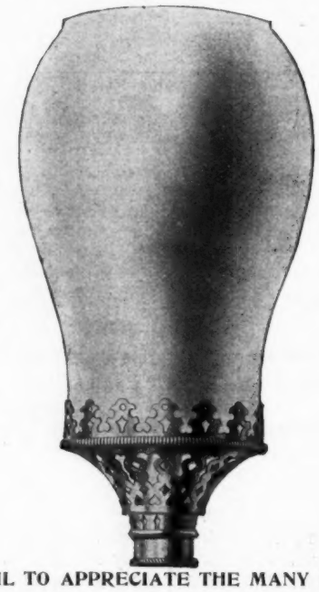

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THE STANDARD DOUBLE SUPERHEATER

LOWE WATER GAS APPARATUS.

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RETORT SETTINGS

Water Gas Cupola Linings, Fire Clay, Etc.

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Modern Recuperative Furnaces.

Standard Fire Brick and Gas Retorts.

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Half and Full Depth Benches of Our Own Design,

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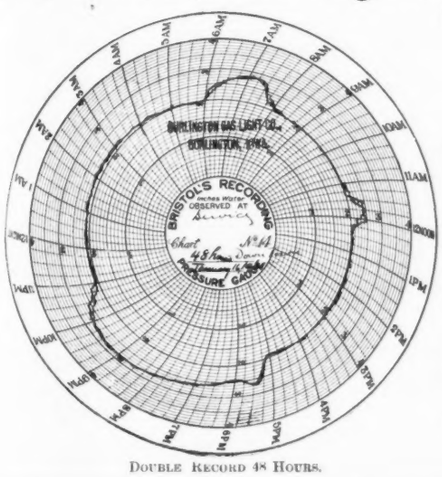

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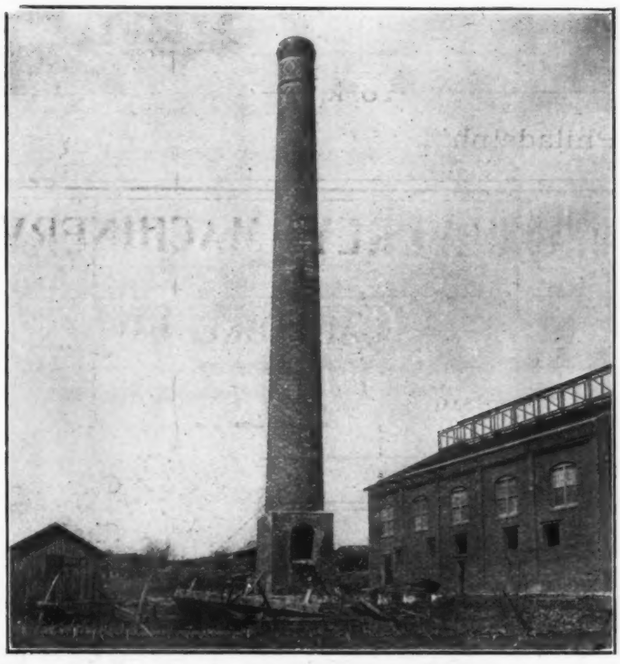

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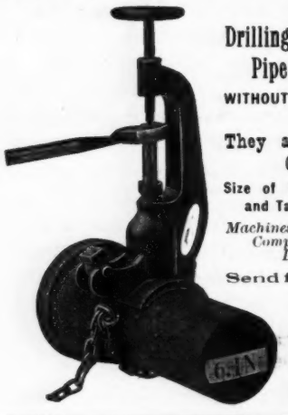

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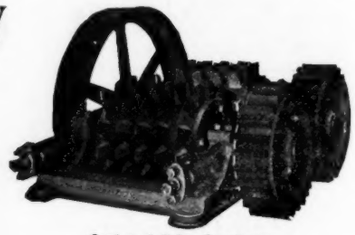

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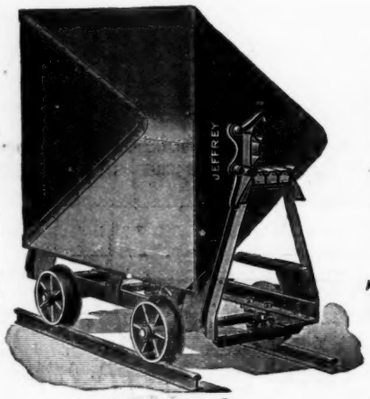

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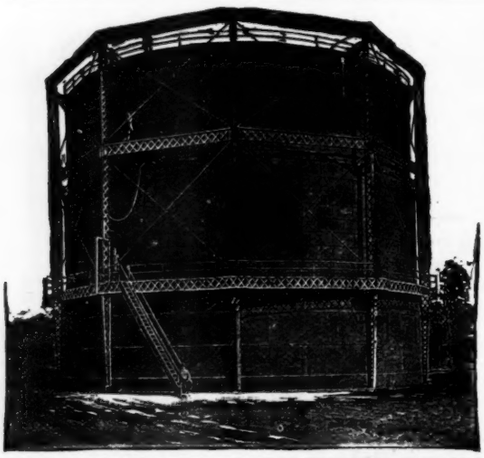

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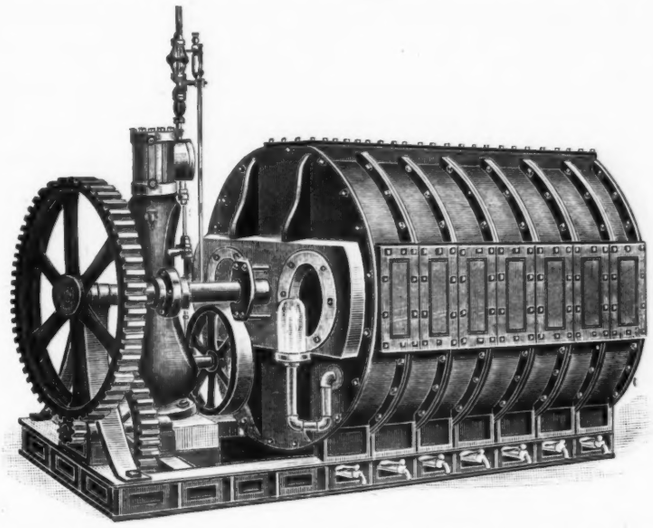

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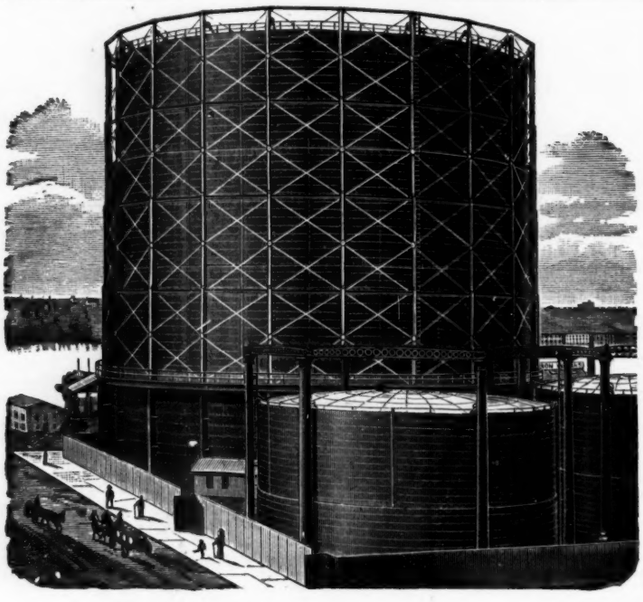

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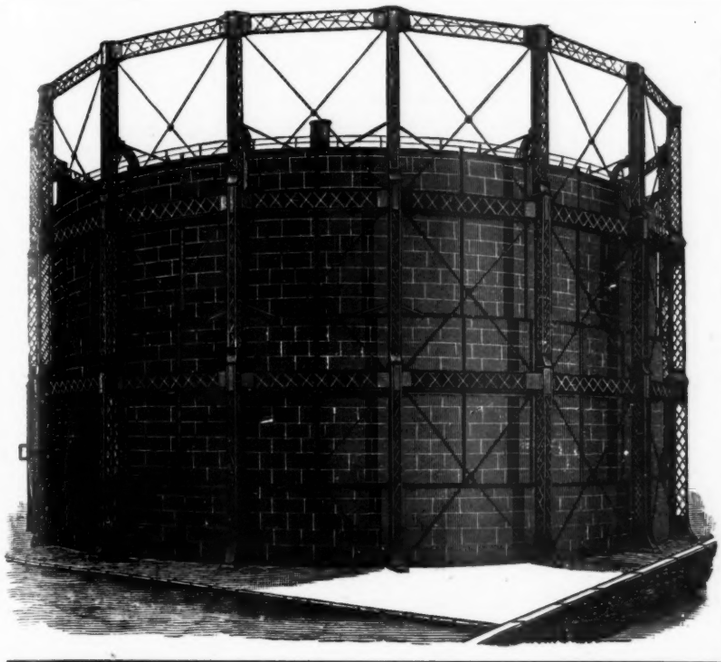

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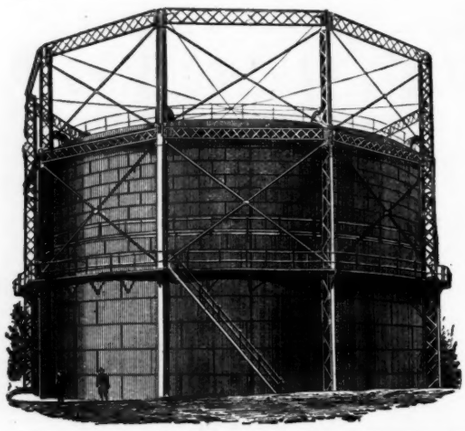

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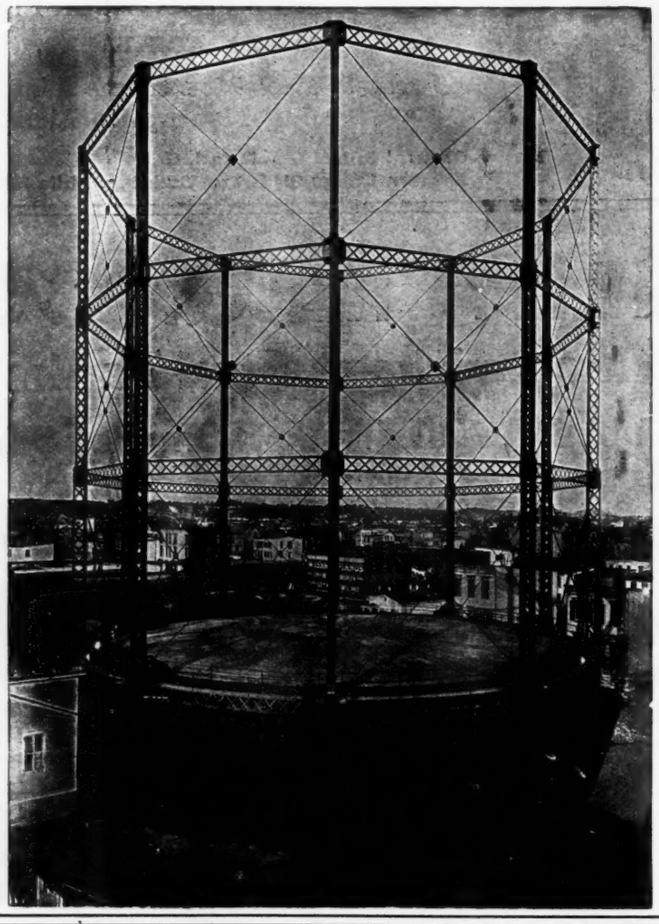

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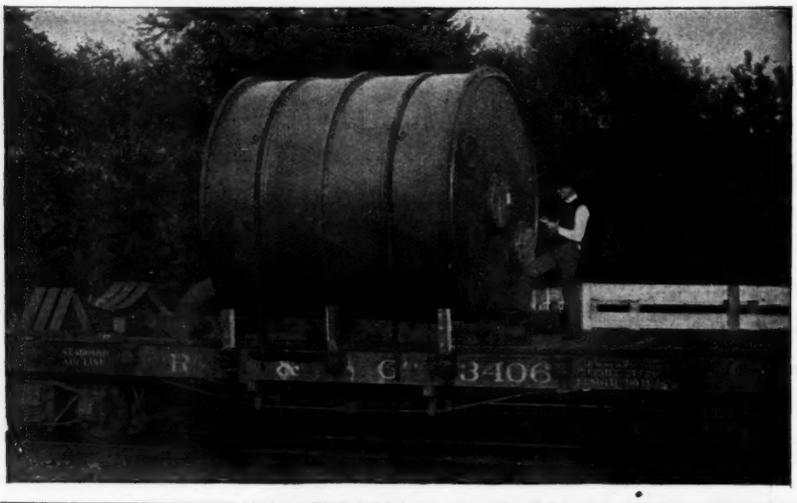

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—OF THE—

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MR. E. H. YORKE, NEW HAVEN, CONN., Dec. 1, 1898.

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